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THE
HOLMFIRTH FLOOD.

“The Flood Came and Took Them All Away;”

A SERMON ON THE HOLMFIRTH FLOOD.

**BY THE
REV. JOSHUA FAWCETT, A.M.,**

**INCUMBENT OF WISEY CHAPEL, AND CHAPLAIN TO
THE RIGHT HON. THE LORD RADSTOCK.**

**TO WHICH IS ADDED A DETAILED ACCOUNT OF
THE AWFUL DISASTER AT HOLMFIRTH;
OBTAINED FROM CORRECT SOURCES.**

**ANY PROFITS ARISING FROM THE SALE OF THIS BOOK, WILL BE
GIVEN TO THE**

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TO THE

RIGHT HONORABLE

THE EARL OF DARTMOUTH,

THE

FRIEND AND HELPER OF SUFFERING

HUMANITY

This Volume is,

WITH HIS LORDSHIP'S KIND PERMISSION,

MOST RESPECTFULLY DEDICATED

BY THE

AUTHOR.

ERRATUM.

The reader is requested to correct the statement made in page 114, respecting the late Rev. Aaron Floyd. It has been discovered since this volume went to press, that the body of that gentleman was not one of those which were washed away.

Page 50, line 5, read *Mrs.* George Hirst and *her* family.

P R E F A C E .



The Author desires to state that this Sermon was preached in Wibsey Chapel, Bradford, Yorkshire, on February 8th, 1852, the Sunday after the HOLMFIRTH CATASTROPHE, (when a Collection was made on behalf of the Sufferers,) and was written without the least idea of its ever passing beyond the narrow circle of his own flock; and that it possesses no claim either to originality of thought, or mode of treatment. It is published at the request and risk of a gentleman, who desires to contribute any profits which may arise from the sale, to the Fund being raised for the Benefit of the Holmfirth Sufferers.

A SERMON.

“ And knew not until the flood came, and took them all away.”
(St. Matthew xxiv. 39.)

BRETHREN, it seems to me the bounden duty of the christian minister to endeavour to turn to spiritual account, them any and diversified circumstances of life. To an eye of common observation, the daily events which occur, are pregnant with lessons of stirring interest and importance; and he loses the advantage to be derived from God's dealings with men, who does not view in everything the hand of God, and as such intended for our instruction and improvement.

An event has happened a few days ago, (February 5, 1852,) not far distant from us, which has formed the subject of universal remark, and excited universal sympathy;

I refer to the bursting of a Reservoir near Holmfirth, and the destruction of human life and property which followed it; a summary account of which will be found in the appendix to this Sermon.

The very mention of this circumstance, will at once show you the propriety of the selection of the words of the text for our present meditation, and their remarkable adaptation to that event.—“*And knew not until the flood came, and took them all away.*”

In the verses connected with these words, our Lord had been declaring that Jerusalem's overthrow and the world's final desolation at the last great day, would be much like the destruction of the old world; and that in two respects:—1, in regard of its *unexpectedness*; and 2, in regard of its *security* and *sensuality*. “*As the days of Noe were, so shall also the coming of the Son of man be. For as*

in the days that were before the flood they were eating and drinking, marrying and giving in marriage, until the day that Noe entered into the ark ; and knew not until the flood came, and took them all away ; so shall also the coming of the Son of man be.” 37—39.*

My object is not to enlarge upon the whole subject embraced by these words ; but simply to confine myself to a few practical remarks upon the coming of death and judgment, as strikingly illustrated by the destruction of the old world in the days of Noah.

- * “They prayed by proxy, and at second hand
Believed, and slept, and put repentance off,
Until the knock of death awoke them, when
They saw their ignorance both, and him they paid
To bargain for their souls ’twixt them and God,
Fled, and began repentance without end.
How did they wish that morning as they stood
With blushing covered, they had for themselves
The Scriptures searched, had for themselves believed,
And made acquaintance with the Judge ere then.

POLLOK.

I.—When “*God saw that the wickedness of man was great in the earth, and that every imagination of the thoughts of his heart was only evil continually ;—the Lord said I will destroy man whom I have created from the face of the earth.*” (Gen. vi. 5—7.) Sad and sore though this judgment of the Lord was, yet, even here, we may see mercy mingling with judgment. This His threatened punishment was not declared, until the Lord had said, “*My Spirit shall not always strive with man.*” God had striven with men in those early days, by inspiring Enoch and Noah, and perhaps others, to preach to them; bearing with them, and waiting to be gracious, notwithstanding their rebellion. Yea, God had long striven; and thereby proved how merciful He was; and it was only when His striving was in vain, that He declared He would strive no more. None are ruined by the *justice* of God,

but those that hate to be reformed by the *grace* of God.

II.—In proof that God was very unwilling to destroy the people of that day, He gave them a *long warning*: He needed not to have given them any warning of His judgment; they gave Him no warning of their sins, no respite; yet, that He might approve His mercies to the very wicked, He gave them, probably an hundred years respite and warning for repenting. How loath is God to strike that threatens so long! He that delights in revenge, surprises his adversary; whereas, he that gives long warnings, desires to be prevented. If we were not wilful we should never smart; and if we were not determined to do so, we should never perish. So long as an hundred years*

* The Author has fixed upon the number of an hundred years as probably about the period over which Noah's preaching extended. There is a difference among the learned upon this point; the prevailing opinion being that the period was a hundred and twenty years. It admits, however, of a question whether the time mentioned in Gen. vi. 3., did not refer rather to the general limit of the age of man, than to the time

did God give that people an opportunity to repent and turn. By this means He shut their mouths against saying that they had not time and space enough for this great work. If they had had only the *grace* of repentance as they had the *season* of repentance, all had been well: but it was not so. These are two very different things. No *season* without *grace* will ever be long enough to work out in the sinner "*repentance unto life.*" And where there is *true grace* there will always be found the *season* to repent in.

III.—Nor was this all,—God not only gave the people time, but also a *faithful teacher*, and such a teacher as taught both with his lips and by his life. Whilst every word which he spoke would be a word of warning—not less so the daily work to which he was called in building the ark. If the

during which Noah was to preach for the benefit of the people of the old world.

people doubted the truth of his preaching, they could not doubt the sincerity of his belief that the threatened judgment would in due time begin. His business in building the ark was a real sermon to the world, wherein at once were taught mercy and life to the believers,—and to the rebellious, destruction.

St. Peter tells us that Noah was “*a preacher of righteousness ;*” and no doubt his preaching would embrace the two grand doctrines of ruin and redemption, of sin and salvation, of destruction by the coming deluge, and deliverance by the rising ark. In this sense, Noah preached the same gospel in type which we do in reality,—the same in shadow, which we do in substance,—the same in figure, which we do in fact.

But whilst Noah was thus faithful and diligent, what was the reception which his warning message met with? Methinks

the sons of Lamech would come to Noah and ask him what he meant by that strange work? Why he built an ark, when they could see no waters to float it? Doubtless they would think that "too much holiness had made this preacher mad." Doubtless they would laugh at him *for* his work, but without doubt they could not laugh him *out of* it. Noah, spite of all, preaches, and builds, and finishes.

Brethren, the treatment which Noah received is precisely that which every faithful minister must make his account for. The preacher of righteousness, now-a-days, must expect no fairer dealing, must look for no more ready belief of the truth. If men in that day laughed at the thought of a coming deluge, men in this day ask, "*Where is the promise of His coming?*" (2 Peter iii. 4.)

As God sent His servant Noah to the people of the old world, so He commis-

sions His ministering servants now to tell, and to foretell, both the judgment that is coming, and the means of escaping it. There was safety in the ark, and only there; there is safety in the Church of Christ, whilst out of it there is none. To look for it elsewhere will be as futile and vain, as the people before the flood found it, when once the waters began to flow.

IV.—Doubtless many hands besides Noah's would help to carry up the ark. Many a one wrought upon the ark, which yet was not saved by it. Our outward works cannot save us, without our inward faith; we may help to save others, and after all perish ourselves; like the scaffolding help to rear the building, and when the building is completed, be removed, as forming no part of it. In this age of outward profession, and much open-handed liberality, this is a point which cannot be too earnestly pressed home upon our con-

sciences, not to check the flow of christian charity, or the ardour of christian zeal, but to put us upon our guard lest we mistake these *ex-trinsic* works for that *intrinsic* faith, without which all works are worthless and vain. To be *of* the church by profession is one thing, to be *in* the church by vital union with its living Head is another; and without the latter, the former is worth nothing at all as to salvation.

V.—Is it asked, what was it which led Noah to act as he did? I answer, it was *faith*. Thus it is written, “*by faith Noah, warned of God of things not seen as yet, being moved with fear prepared an ark to the saving of his house.* (Heb. xi. 7.) In full persuasion that God would fulfil His word, Noah complained not of the arduous task assigned him, but in good earnest set about the work he was required to do. He knew that God had said it; and therefore it was not more his duty

than it was his interest to obey. He knew that the doing of that work would expose him to the taunts and reproaches of the world around him *; but what of these, so long as he was satisfied in his own mind that he was doing the Master's bidding? In like manner, the same spirit of faith will enable us to pass through the same trying ordeal as he did.

Brethren, is it not wise to trust or serve the Lord? Let us pause and admire His grace and faithfulness in the instance before us. Did He leave this righteous man to the insults of his enemies? or did He leave him to share the doom of his enemies? Oh, no! Did He not fulfil His word both of judgment and mercy; of

* "Infidels have pretended that the ark was not large enough to contain all the creatures which were to be preserved in it; but it appears from the calculation of learned men that it was amply sufficient—being 550 feet long, 90 feet wide, and 50 feet high—it would hold about 43,000 tons of lading, and would hold more than 40 of our Ships of a 1000 tons each. It was nearly as long as St. Paul's Church in London; and if all the animals together, as the learned have computed, would not be equal to 500 horses, there would be room enough and to spare."

judgment to the world, and of mercy to Noah?

The ark was a lively type of salvation by Christ.

1.—The ark was not a building of man's device, it came directly from God.*
"Christ came forth from the Father."
 (John xvi. 28.)

2.—The ark was built on purpose to save men's lives. Christ was sent into the world *"that men might live through Him."* (John iii. 17.)

3.—The ark was *the only* means of safety; Christ is the only Saviour. *"There is none other name under heaven given*

* It has been discovered that the ark was very wisely and wonderfully built, and that its proportions are the same as those of the human body; for the ark was six times as long as it was broad, and ten times as long as it was high; and the length of a man's body, from the crown of the head to the sole of the foot, is six times the breadth from one side to another, and ten times the thickness from the back to the chest. In the 17th. century Peter Hans had two ships built after the model of the ark. It was found that they carried one-third more than other vessels of the same burden; and that they were by far the swiftest sailers.

among men, whereby we must be saved.
(Acts iv. 12.)

4.—There was a door into the ark: this points to Him, who saith, “*I am the door: if any man enter in, he shall be saved.*” (John x. 9.)

5.—There was a window in the ark, and that window was above. Christ saith, “*I am the Light of the world.*”

But though the ark be so significant as a type, it fails and falls infinitely short of the anti-type and the blessed reality. It cannot fully set forth the salvation that is by Christ, though it may help us some little in our conceptions of it.

And now that the ark is completed, the Lord *invites* Noah to enter in. “*Come thou and all thy house into the ark.*” (Gen. vii. 1.) He does not say to him “*Go into the ark;*” but “*Come thou, &c.*” May we not have here an early intimation of the Gospel call which thus runs, “*Come unto*

me all ye that are weary and heavy laden."
"And the Spirit and the bride say, Come,
&c." (Matt. xi. 28; Rev. xxii. 17.)

And then when Noah had entered in, the Lord, loath to punish, granted a further seven days reprieve. "*For yet seven days, and I will cause it to rain upon the earth.*" (Gen. vii. 4.) How slow is God to take vengeance, how ready to forgive. But, alas, they who would not take the longer warning, now refuse the shorter; a sure token this of the conduct of men in all ages. They who will not be persuaded by God's long-continued forbearance, will not when His forbearance is drawing to a close.

One thing is deserving of notice in this history, and it is this:—It is written, "*and the Lord shut him in.*" (Gen. vii. 16.) This is most blessed indeed! Noah could not have shut himself in; neither could he have been preserved there if the Lord

had not shut him in. And herein is magnified both the freedom and the riches of sovereign grace ; for the same Almighty hand which shut him *in*, shut the rest *out*.

Before Noah entered in, we may imagine to ourselves the scene which would be depicted when he took his last farewell of the old world and its guilty inhabitants, to see them again no more for ever. Soon "*the fountains of the great deep were broken up,*" "*and every living substance was destroyed which was upon the face of the ground.*" Oh the lamentable and bitter cries of thousands perishing by that very calamity, the warning notices of which they had refused to attend to, or had presumptuously derided! Many of Noah's relations must have been of the number of the lost. What distress must he have felt for them ; but "*Noah could deliver but his own soul !*" (Exek. xiv. 14.) His distress was useless ; they had despised his warning, and now

“*repentance*” was too late, it was “*hid from their eyes.*” “Now as they formerly rejected God, so were they justly rejected of God. Ere judgment begins, repentance is seasonable ; but if judgment once begins, men cry too late.”

VI.—Let us now turn to consider how the threatened visitation at last came down upon that impenitent people.

1.—It came upon them when they felt themselves *secure*. They neither felt nor feared evil. True, Noah had been long forewarning them, but they believed him not ; they treated his work of building as the folly of a madman, and his work of preaching as no better. And it is even the same now. It may be, men will tell you they believe that there is a judgment to come ; but their belief has but little, if any practical effect upon them. The truth is, men are by profession, rather than by practice, christians. There is a

secret lurking of an unbelieving, if not of a direct infidel spirit within them, which keeps them from giving that hearty and practical attention to religion which they ought to do. Hence their fatal security. Hence they cry, "*Peace! peace!*" when "*sudden destruction cometh,*" and is "*hard at the door.*"

In the case of that awful visitation which has lately occurred at Holmfirth, we have a painfully correct instance of all this. Though there had been a general impression abroad that danger was in all probability near at hand, and though some, with more foresight and prudence than others, prepared for the worst which might happen, yet the major part of the inhabitants went to rest as secure as usual, expecting to rise on the morrow to the discharge of the duties which the morrow would impose. And thus it will be at the end of the world. Se-

curity will seal men's eyes to the awful reality of the coming judgment, and that judgment will overtake them "*as a thief in the night.*" "*So will also the coming of the Son of man be.*"

2.—The destruction came *suddenly* upon the old world. Though the warning had been long, the event when it happened, happened in a moment. And so it is, brethren, at death. To the most wakeful servant, the master's coming is always a *sudden*, though not a *sad* surprise; but to those who are tempted to say, "*My Lord, delayeth his coming,*" that coming will prove not more sudden than sad.

In the case of the sufferers at Holmfirth, we have an apt illustration of this truth. Whilst many of them "*knew not of it,*" but were fast locked in the arms of sleep; when they were awaked from their secure repose, how *sudden* the destruction that awaited them.

3.—When the destruction came upon the old world, there was no escape, it “*took them all away.*” The boldest, hoping to outrun the judgment, climbed up to the high mountains, and looked down upon the rising waters with more hope than fear. And when they saw the hills, one after another, disappear, they climbed the tallest trees ; and, doubtless, while they saw their own wickedness and folly, they envied that ark and its inhabitants which before they had beheld with scorn. But in vain did they fly when God pursued. Brethren, there is no way to fly *from* divine judgment, but to fly *to* divine mercy for repentance.—In a minor sense, we may see in the melancholy catastrophe which has occasioned this address, an illustration of this awful truth, that when judgment has begun, then deliverance is too late.

4.—But whilst the great mass of the

world felt the severity of God's punishment, the ark proved a place of safety and refuge to Noah and his family. Securely did he outride the uproar of heaven, and earth, and waters. He knew that He who owned the waters would steer him ; that He who shut him in would preserve him. How happy a thing is faith ! what a quiet safety, what an heavenly peace does it work in the soul, in the midst of all the inundation of evil.—In like manner in the case before referred to, whilst some were swept away, and there was no escape ; others were saved from the devouring element, monuments of God's sparing mercy, let us hope, to become monuments of his saving grace.

Let us now turn to consider, in *conclusion*, the *practical* application of this whole subject.

1.—It tells us of *danger to be appre-*

hended. There is a deluge of wrath coming upon the whole world of the ungodly. That which produced the flood in Noah's time, will bring a more dreadful punishment upon every unpardoned soul. You and I, brethren, know nothing, except as a matter of history, of the former *deluge*; but if unpardoned, and unsaved, we shall know something as a matter of painful experience of that *fire* which will consume all the adversaries of the Lord. Let then this subject furnish us with a lesson of *warning*.

2.—But let it also furnish us with a lesson of *encouragement*. If it speaks of *danger to be apprehended*, it speaks no less of a *defence* and *refuge* from that danger. What the ark was to Noah and his family, that Christ is to us. All who took refuge in the ark were saved, and none but they; in like manner,

there is salvation in Christ, and no other.

When the ark was completed, and all things ready for the reception of its inhabitants, "*The Lord said unto Noah, Come thou and all thy house into the ark.*" Who sees not here the gospel call, the merciful invitation of infinite, and unspeakable love?

See here how God made a distinction between Noah's family and the rest of the world. Till they were safely housed, the waters could not flow down; and the moment they were safe, the waters could not be kept within their natural boundaries. A lesson this, alike of *encouragement* to the Church of God, teaching them that they shall not share the doom of the world; and at the same time, a lesson of *warning* to the ungodly, teaching them that they shall not share the safe protection of the righteous.

Lastly, let this subject instruct us in our *duty*. If there be *danger* to be avoided, and a *defence* provided, our *duty* lies in availing ourselves of that defence. That duty is briefly expressed on this wise; “*Come thou and all thy house into the ark.*” There must be something more than mere *looking on*, there must be *entering in*. Too many content themselves with the *former*, and neglect the *latter*.

Many no doubt helped to build the ark who were not saved in it; yea, many of Noah’s relations in the flesh were not saved with Noah; in like manner, the mere fact of outward kinship with God’s people, and helping to carry on God’s cause, will not avail any who are not one in Christ, and one with Christ.

Next, and only next, in importance to our own soul’s salvation, should be our diligence in promoting the salvation of our families and households. “Come thou

and *all thy house* into the ark." To meet as one united family at the last day, what more delightful! to find those who were united in time, dis-united and separated for eternity, what more heart-rending! And yet it is to be feared that such will be the case with too many. Being warned beforehand of the possibility of such a peradventure, may God give us all grace to strive to promote, next to personal, family religion; so that in the day of Christ's appearing, we and those whom we love may be found encircled within one embrace, and hear the joyous note of that voice which shall cry, "*Come, ye blessed of my Father, inherit the kingdom prepared for you from the foundation of the world.*" (Matt. xxv. 34.)

"Great God! What do I see and hear,"

The end of things created?

The Judge of mankind doth appear,

On clouds of glory seated:

Beneath his cross I view the day,

When heaven and earth shall pass away,

And thus prepare to meet him.

APPENDIX.

APPENDIX.

AWFUL CATASTROPHE AT HOLMFIRTH, IN THE WEST-RIDING OF THE COUNTY OF YORK, BY THE BURSTING OF A RESER- VOIR, FEBRUARY 5, 1852.

(← The compiler of this account is indebted to the courtesy of the Editor of the "Halifax Guardian," from whose correct reports the following statement has chiefly been made.

RESERVOIR.—Between the hours of one and two o'clock on Thursday morning last, (February 5,) a most awful calamity occurred at Holmfirth and the neighbourhood, by the bursting of an immense reservoir. The accident has occasioned a terrific loss of life and property, and will

inflict the greatest possible distress upon the entire district for many years to come. It appears that some 14 or 15 years ago, an act of parliament was obtained for the construction of a large reservoir at the head of the Holme valley, in the neighbourhood of Holme Moss, for the supply of the mills erected along the course of the river during the dry seasons. The mill-owners were to be rated in proportion to the fall of water, and the affairs of the company conducted by a board of commissioners, consisting of 70 individuals. The scite fixed upon for the formation of the reservoir is at the junction of two streams on the bleak and wild mountainous range of hills on the borders of the three counties of York, Chester, and Lancaster, the deep and narrow valley of Holmfirth stretching to the east. The scite was, perhaps, the most favourable that could have been chosen; but from the circumstance of the valley being so deep and narrow, and the mountain streams so liable to be suddenly swollen, a greater amount of

engineering skill was required than, we are afraid, will prove to have been engaged in the original formation of this immense sheet of water. The plan adopted was to erect an immense wall across the valley, and thus dam-up the two streams alluded to ; Marsden Clough being to the right of the reservoir, Good Bent Clough to the left, and Good Bent hill separating the two streams. Everything, of course, depended upon the stability of this wall. We are unable to give a correct measurement of it ; but judging from the eye, the wall is (or rather was) about 120 yards wide, and 23' yards high, a large culvert being made on the easterly side. The thickness of the base could not correctly be ascertained, so much of it being washed away. It inclined by a gentle slope towards the reservoir, the face of the inside wall being paved as high as the culvert. The wall on the other side was much more precipitous, and had never been faced with stone. The bur-wall was composed of sand and stones thrown

down loosely, and does not appear to have been built up (if that term may be used) with that compactness it ought to have been. Previous to this wall being commenced the foundation was puddled; and during this operation, we are informed, the contractor met with a spring of water, nearly in the centre where the embankment was to be thrown up, and which gave him an immense amount of trouble. The gush of water is said to have been the thickness of a man's arm, and every means was resorted to, in order to plug-up this valuable stream. An eminent engineer at Leeds, was consulted, who advised the stopping of the flow of water before any further measures were taken. Every scheme which ingenuity could devise was tried, but all to no purpose; until it was said at the time that if the whole of Holme Moss had been tumbled down at the top of the spring the water could not have been prevented flowing. With this difficulty unsurmounted—with a spring of water in the evry

centre of the puddle-bed—the contractor proceeded with his work ! The reason we heard assigned by an old inhabitant, residing on the mountain, why this spring of water was not stoppèd-up, was—that the commissioners could not afford to lay out any more money in puddling ? The consequences might easily have been calculated ; and in fact the dire calamity which we are about to record, was generally foretold from the very first. The spring of water at the base of the mound constantly let down the puddle, and washed it away down the mountain torrent.

This evident defection in the bur-wall was viewed with alarm by the mill-owners having property situated on the stream, until the imminent peril they were in, from a sudden rupture of this lateral wall, became a household word. This fear of a mighty inundation has reigned in the minds of the entire population in the valley ; and upon several occasions, and especially during any sudden fall of rain, numbers of people have located themselves

on the neighbouring hills, expecting to see the reservoir burst. This fear of the embankment giving way, became so great about four years ago, that a Mr. David Porter, contractor, was engaged to repair it. He opened the embankment and put in an immense amount of material for the purpose of preventing a rupture. Whether he ascertained the reason of the embankment giving way or not, we are not aware; but it is said he told the Commissioners he had not got down low enough, and that a further opening must be made, and more puddle put in, if the evil was to be remedied. Parsimony, it is said, again prevailed. The contractor declared his work not to be accomplished; but as further operations would be attended with more expense, he was ordered to desist; and with a full knowledge of the extremely dangerous state of the embankment, and in spite of the fact patent to every man, woman, and child in the district, that the reservoir *never* held water to the satisfaction of the mill-owners, no further steps

were taken to avert what was sure to come to pass sooner or later. In fact, it resolved itself merely into a question of time as to how soon the spring of water would wash away the puddle, and let down the whole of the embankment.

We have stated that a culvert was erected on the easterly side of the embankment; but whether it was of sufficient capacity for a reservoir covering some 12 or 15 acres of land, is not for us to pronounce an opinion upon. Certain it is, however, that it was liable to be easily stopped up. A few years ago, it was found that the shuttle was prevented being drawn, by a piece of timber being jammed against it; but no precautions seem to have been taken to prevent a similar disaster. On Sunday, February 1st, the man whose duty it was to attend to the shuttle found that it was again out of order; and, although the united strength of three men was brought to bear upon it, not one jot could it be moved. In this alarming state of things, we are not aware that any means were adopted to

remove the obstacle, or to avert the threatened danger, by cutting a sluice, or taking down a portion of the embankment, and by this or some other means, reducing the immense pressure of water against the already weakened lateral wall. On Monday, when it was found that a less quantity of water than usual was flowing through the culvert, an alarm began to spread through the neighbourhood, which was greatly increased by the heavy fall of rain. Several of the inhabitants were warned of the impending danger ; but there had so frequently been similar warnings held out, that, while some took heed to it and escaped a terrible death, others laughed at the outcry, and were in consequence swept away by the flood.

Considerable variety having been found in the estimates of the capacity of the reservoir, we are happy to be enabled, upon the measurements of Mr. Horsfall, land-surveyor, Halifax (taken on February 5th), to state that the area it covered when filled would be about $6\frac{3}{4}$ acres ; and that

the embankment wall measures about 100 yards across, and the circular well, or funnel, 58 feet high from the top to the surface of the water now running through the clow. This circular well is 12 feet in diameter at the top, giving an area of about 113 square feet; but the outlet of the culvert into which it leads is little more than half a circle, about 5 feet in diameter, giving an area of outlet both for the funnel (could it have acted) and the clow, of only about 10 square feet.

Allowing for the back-water up the two cloughs supplying the reservoir, its area would be at least 7 acres; and, as the engineer at Bilberry mill states that the water rose on the day before the accident at the rate of 18 inches an hour, we have data upon which to calculate the required outlet. The area of seven acres is 33,880 square yards, or 304,920 square feet. A rise of 18 inches upon this surface indicates an addition of 457,380 cubic feet of water, filling the reservoir at the rate of 2,850,480 gallons per hour, the weight of

which (apart from the force it would subsequently acquire in its rapid descent down the doomed valley) would be 14,725 tons.

Mr. Bateman, the able civil engineer under whose direction the Manchester waterworks (to which we have already alluded) are now being constructed, reports that his discharge pipes, which are 4 feet in diameter, and under a pressure of from 80 to 100 feet, deliver from 500 to 600 cubic feet per second. These pipes are circular, and their area $12\frac{1}{2}$ square feet. In any comparison with the culvert at Bilberry reservoir allowance will have to be made for its shape (a semi-circle with a bed of silted rubble and gravel) and also for the lesser pressure of the column in the reservoir.

We will not further anticipate the engineering evidence which will, no doubt be adduced before the jury (whilst this Book is in the Press), than to record the universal opinion that the embankment itself was sufficiently strong to have upheld the water at its utmost

depth, had there been a proper puddling and an adequate bye-wash. But there is a proof on the embankment as it now stands that this matter had not been duly attended to. The top of the embankment has been suffered to become "saddle-backed;" and near the circular well, which *should* have been a bye-wash, there is a hole in the embankment which betrays the sinking and washing away of the puddle within. A similar hole to that was in the very top of that part of the embankment which has been washed away. When the water, therefore, began to overflow the embankment at that part, it not only washed away the outer slope of the embankment (which was its only resistance to the pressure of the water in the reservoir) but burrowed within the wall itself, down the hole which indicated the failure of the proper puddling beneath. To this cause, and to the general sinking of the embankment must, no doubt, be ascribed the fatal fact that the reservoir was left entirely without bye-wash, or any means of

extraordinary outlet except at the expense of the embankment which was the only safeguard of the lives and property in the valley below.

These statements, which, on our visit to the scene, "the whole country side" united in making, have called for the earnest attention of the coroner's jury, impanelled upon the absolute crowd of victims so suddenly and sadly hurried at dead of night into eternity by a calamity which we now notice as described to us by eye-witnesses.

On Wednesday, February 4th, there was a regular down-pour of rain, which continued, without intermission, throughout the entire day. The contracted valley of the Holme is, of all valleys in Yorkshire, subject to sudden inundations; and during the whole of the day the river was very much swollen and considerable damage done to the houses on its margin. In the midst of this perfect deluge of rain the fearful alarm was raised that the Holme reservoir was filling fast, and that no out-

let could be made for the accumulating waters. Holmfirth being situated about $3\frac{1}{2}$ miles down the valley, the alarm does not appear to have reached so far as that village; but in the immediate locality of the mountain lake the terrific cry spread like wild-fire; and during the whole of the evening, numbers of people, despite the pelting storm, were assembled on the neighbouring heights waiting with trembling expectation some awful catastrophe.

The engineer who resided at Bilberry Mill, which is situated immediately below the base of the embankment, says that about ten o'clock the water first began to flow over the bank. The reservoir had been filling during the whole of the day at the rate of eighteen inches an hour, and the action of the wind against the inner face of the embankment was also considerable. The very first overflow of water swept away a considerable portion of the outer embankment; which, not being faced with stone offered no resistance to the torrents of water pouring down its surface. Large

fissures were immediately made in the grass-covered embankment, and tons of loose earth and rubbish carried away. The outer bank was soon gone, the puddle bank next gave way, and then, just as though the inner embankment had been struck with lightning, the whole mass of earth-work gave way with a loud thundering crash, and the pent-up waters which formed this gigantic reservoir rushed with fearful velocity through the opening thus made. This terrible outburst was described by some of the spectators who were on the neighbouring hills at the time as being awfully grand. The moon was shining brightly when the embankment gave way, but the wind howled fearfully as though some portentous event was about to happen. No doubt our informants who witnessed the dreadful sight, spoke truly when they said that the impression produced upon their minds as they gazed upon the mighty torrent of water as it surged down the valley will never be effaced. We have already

stated the capacity of the reservoir, and the terrible consequences which ensued down the peaceful valley, may perhaps be better understood, when we add that the immense reservoir emptied itself, or at least down to its present level, in about twenty minutes !

We have been careful in giving as full and correct an account as possible of the origin of the sad scenes which it is now our painful duty to record. Nor can we proceed to our sad task without expressing our regret that no means were tried to lessen the pressure of water against the embankment. Peradventure it may turn out that the unparalleled loss of life from such a catastrophe, the incalculable loss of property, and the desolation of an entire valley may have arisen from a tree-root preventing the shuttle of the culvert being raised ! As nearly as we could ascertain, it was about one o'clock when the embankment gave way ; but the testimony of many parties whom we questioned varied some little

upon this point, while some of the spectators who saw the catastrophe were so horror-struck at the sight, that they could only give a confused account of it.

The engineer to whom we have before alluded, ran to Bilberry Mill the moment he saw a likelihood of the embankment giving way, and managed to get a few articles out of the premises when the flood was upon him. He had a narrow escape of his life. The mill, which was occupied by Messrs. Broadbent and Whiteley as a fulling and scribbling mill, is completely gutted. A house in the immediate locality, occupied by Mr. John Furness, was partly destroyed, and an adjoining barn and stable swept away bodily. Three cows and a horse were in the premises at the time and were washed down the stream. A stack of hay, valued at £40, withstood for a moment the mighty shock and the next was engulfed and carried away. Fortunately the family were aware of the danger, and had removed out of the house when the mischief happened.

MIDDLE DIGLEY MILL.—The next scene of devastation was at Middle Digley Mill, occupied by Mr. Furness, and used as a woollen mill. The mill is erected broadway across the valley, with a dwellinghouse on the left-hand side. Fortunately at this point the valley widens considerably, and in the rear of the mill stood the house occupied by Mr. Furness, and as it faced the coming current acted somewhat as a break, like the bowsprit of a vessel, against the coming waters. The cottage house adjoining the mill was nearly swept away; but the walls of the mill were left standing. Nearly the whole of the machinery was washed out of the windows and doors, and a large quantity of pieces also carried away. Fortunately the family residing in the cottage house had timely warning given them and escaped; but every vestige of furniture, bed linen, &c., is gone. Between this mill and Digley Mill a singular scene of devastation is presented. The day previous, we were told, that the valley was covered by green

pastures; but when we visited the place on the day of the disaster we could only conceive it to be the bed of some mighty river. The ground was covered with sand and loose stones, which had apparently been washed for ages by some mountain torrent. Some of these stones were of immense size, and one of them was computed to be at least 4 or 5 tons weight. It will be a work of immense labour to remove these stones and rubbish, if ever the great cost can be incurred.

DIGLEY MILL.—A little below this singular scene of devastation, the valley becomes contracted into a narrow gorge; but in spite of the natural disadvantages of the situation, the enterprising genius of a British manufacturer had been evinced in the erection of some very extensive premises known as Digley Mill. On the left of the river some extensive dye works were erected, and a little lower down on the same side a large weaving shed. Between the two there was a wright's shop, a mistal, barn, cart shed, &c., and two cot-

tage houses. On the opposite side of the river stood five cottages, and a large woollen mill. The whole of this extensive property, with the exception of the mill chimney, was swept away! Such a complete and utter wreck we never before witnessed. One can conceive of a single building being gutted; but to be told that only the day previous the property we have briefly described was situated upon either bank of the river, appeared a marvel. Of the cottages scarcely a vestige remains, but imbedded in the river are unmistakeable tokens of extensive works having recently been planted there. Part of the steam engine remains; but the huge boiler was floated down the stream as though it were only the weight of a tin tea kettle. No pen can describe this terrible wreck of property. Some of the dye pans remained; but all the machinery and valuable store of goods were gone—all swept away. We have heard the loss at this place variously estimated, and should think that £20,000 was under rather than over the mark. During

the whole of Thursday, Digley Mill was visited by thousands of spectators; and certainly such a terrible scene was never witnessed before by man. Fortunately Mr. George Hirst and his family were saved, having been made aware of the extreme probability of the reservoir bursting during the night. We had an opportunity of hearing the evidence of two of the tenants occupying the cottages on the right-hand side of the river, and shall give it pretty much in their own words.

Peter Webster said that having heard that the reservoir was in an unsafe state, he went to look at it about half-past ten o'clock on Wednesday. He saw a large hole which had been washed in the inner embankment, about three yards from the top; the wind was blowing hard at the time, and fearing that the embankment would break, he gave a warning to that effect to the inhabitants at Digley Mill, and owing to his foresight not a single life was lost at this place. From what he saw at the reservoir he could not rest

until he had visited it again, and went up accordingly after midnight. While thus proceeding on his journey he met a man, who in breathless haste exclaimed, "Peter, its coming, run back." Webster immediately returned, and soon after, the whole valley was inundated. He describes the rolling of the tumbling waves down the valley as being awfully grand. His house was swept away, but his wife and children escaped with their clothes on their backs, being the only things they saved excepting half a loaf of bread and an old crust of cheese. They formed a pitiable group when we saw them in the upper room of a small warehouse, built higher up the hill side on the left hand, and which fortunately escaped the wreck.

James Armitage the miller, said, that having been warned by Webster he took the precaution to remove his family, but every vestige of his property had been swept away. He said he stood on an elevated position upon some steps, and saw the first approach of the waters.

According to his own vivid but homely description, the mill, weaving shed, and dye house, went "crash, crash, crash," and in ten minutes or less the whole of the extensive premises were gone! He relates a most wonderful escape of a young man, who had been confined to his bed by an attack of rheumatism. Fearing that a flood would come, Armitage, along with three other men, wrapped the sickly man in blankets, and carried him out of the house to a neighbour's house high up the hill side. They had just got him out of the house when the torrent swept past. One minute later and the whole five would have perished.

It is providential that this awful calamity occurred during the night; had it occurred a few hours later, the whole of the hands employed at these works would have been on the premises, and the probable loss of life under such circumstances makes the blood run chill to contemplate. This remark also will apply to the other mills partially or wholly

destroyed by the rapid descent of this terrible flood.

BANK END MILL.—The next scene of destruction down the stream was at Bank End Mill, occupied by Messrs. Roebuck, and used as a woollen mill. The east end of the mill was forced in, and a great portion of the machinery washed away. To add to the cumulative force of the destructive current, the mill dam gave way. Fortunately, no loss of life occurred in this locality.

HOLME BRIDGE.—At this part the valley, which has run from west to east, assumes a north-easterly direction, and is a considerable width, and the water, therefore, was spread over a much greater surface, but left sad evidences of the amazing velocity with which it swept along. Holme Church is situated on one side of the valley, the steeple facing up the stream. The church-yard walls were tumbled down, nearly all the tombstones overturned, and several of the bodies, it is said, washed out of the graves. The church doors were

stove in, and such was the force of the waters that the whole of the pews on the floor of the church were lifted up bodily. Cushions, prayer-books, &c., were washed away in great numbers; and the interior of the church presents a most lamentable aspect. A goat, which was last seen feeding in the grave-yard, was found dead in the middle aisle of the church, having been washed there by the flood. The battlements and one of the arches of the bridge are washed away, rendering the valley impassable. The gates of the toll-bar house were also lifted from their position, and swept along by the fury of the torrent, but the bar-house escaped. The wreck of property left by the flood when it subsided is immense; mud, broken machinery, woollen pieces, large beams of machinery, and broken furniture were spread over the fields to a great extent. The houses of the inhabitants bordering upon the stream were inundated, their property either spoiled or destroyed, and such was the quantity of mud and filth which had accu-

mulated in and about their dwellings, that a most awful stench was occasioned, and the next evil to be feared is the outbreak of some dreadful pestilence. The inhabitants appeared to be in a state of bewilderment bordering upon distraction, and tears were in almost every eye.

HINCHLIFFE MILL. — We now approach a spot where the most appalling scenes were witnessed, and where the uncontrollable fury of this terrible visitation manifested itself in its most fearful form. Hinchliffe Mill is occupied by Messrs. Butterworth and Co., and like the rest of the mills in this locality is used as a woollen mill. A large dam extends on the easterly side of the mill, and on the other side of the river six cottages were erected immediately opposite the mill, the rivulet dividing the respective buildings. On the easterly side of these six cottages was a large mistal, and above that another long row of cottages upon the immediate banks of the river. This row of houses is

called Water Street, and it was in this locality where the most terrible loss of life was occasioned. From the information we were able to collect, it appears that a general rumour prevailed that the reservoir (which is about $2\frac{1}{2}$ miles up the valley) was in an unsafe state, but no specific information was conveyed to the unfortunate inhabitants that immediate danger was apprehended. Like the story in the fable, the cry of "wolf, wolf," had been raised so repeatedly, and that no "wolf" had ever come, that the inhabitants generally laughed at the idea of the reservoir bursting and retired to rest in fancied security. Fatal security!

In order to appreciate the dreadful scene to which we are now about to introduce our readers, it must be borne in mind that the six cottages to which we have alluded as being erected on the opposite bank of the river to which the mill is erected, faced sideways to the stream, the dam head being imme-

diately opposite. These cottages were occupied respectively by Eliza Marsden, Joseph Dodd, Jonathan Crossland, John Charlesworth, James Metterick, and Joshua Earnshaw, with their families. In all, 44 individuals retired to rest in that clump of houses on Wednesday night, and soon after they had gone to sleep,—or at all events retired to bed,—36 of them met a watery grave. The following is the sad record:—

Eliza and Nancy Marsden and two sons—all lost.....	4
Joseph Dodd, wife, and two daughters—all lost.....	4
Jonathan Crossland, and seven children—all lost.....	8
John Charlesworth, wife, and eight children—seven lost	7
James Metterick, wife and twelve children—nine lost...	9
Joshua Earnshaw, son, grandson, and grand-daughter— all lost	4
	<hr/> 36

Thus out of this terrible catalogue four families have been clean swept away! The whole of the houses were carried away by the flood, and when we visited the scite upon which they stood, an old rusty can was the only article we saw. Houses, furniture, beds,

and inmates—all were swept away. A person who saw the houses go, described the scene thus,—“I was looking out of the window and saw the water coming rolling down the valley. In a minute after I saw the six houses wobble a bit like, on the top of the water, and then they all went away.” With regard to the three first families on the list nothing can be said, excepting that one or two bodies have been recovered,—the rest were carried along by the mighty torrent. Three of Charlesworth’s children by some means made a miraculous escape. They ran to the door of a neighbour named Ellis, and were fortunately taken in by him only just in time to make their escape out of the top of the house. Other two children of the same family had escaped as far as the top of the fold, leading into the turnpike road, but returned to rescue two hens which they kept, and by so doing were caught and drowned.

In the family of the Metterick’s two re-

markable circumstances occurred. The eldest son (William), who does not live there, had been for a warp, and the evening being so very wet and stormy he decided to stay all night at his father's rather than encounter the storm in going home to his family. He was drowned. Another son, 24 years of age, was washed out of his bed-room, but fortunately got astride a small beam, on which he managed to balance himself, and was carried with tremendous impetuosity down the foaming waves. Fortunately the end of the beam pointed itself in the direction of the dam adjoining Mr. Harpen's mill, and borne up by the beam he swam into the harbour of refuge, and was rescued from his frail life-boat in a state of extreme exhaustion.

Immediately in the rear of the scite upon which these cottages formerly stood in another row, the lowermost of which is occupied by Robert Ellis. It was to this man's door that three of Charlesworth's children ran when the flood first ap-

proached. He heard their knock, and immediately opened the door—let them in—and the moment after he had closed the door it was burst open—and the house inundated. Some stockings had been hung up to dry on the bread creel, and when he saw them on Thursday they were marked with sludge half way up the leg, showing the height of the water in the house. Ellis had a most miraculous escape ; he ran up stairs with his children, and those of Charlesworth's, and fourteen of them made their escape out of the top of the house. The great rise of water in this immediate locality and sudden destruction of an entire row of houses, probably arose—first, from the narrow confined water course opposite the houses ; and secondly, owing to the bursting of the mill dam immediately in their front. A double force would thus be brought to bear against this pile of buildings. It is seldom that we have read before of such direful destruction of life and property as this we have just narrated.

The next building higher up the stream is a mistal, where a valuable cow was drowned ; and above this building stands another row of cottages, in continuation of Water-street. A great loss of life was occasioned in this row of houses. But several wonderful escapes are narrated. The cottage occupied by Joseph Brook, wife, and child, was perfectly inundated. The wife and child were lost, but Brook was saved. Brook gives a most affecting account of the loss he has sustained, and of his own narrow escape. He says that he and his wife slept "in the house," and his little daughter up-stairs. The child awoke about half-past one o'clock and came down stairs, exclaiming, "Father, father, I am frightened by the wind." The father at once leaped out of bed, hearing a strange, unearthly sort of noise. He ran to the window, and the next moment exclaimed, "Its not the wind, its water, and the water is on the door-stones ; run up stairs." He says he did not know but that they were all running up-stairs ; but when he got in the chamber he found

himself alone. In a moment he heard the water rush through the door of his house, his daughter gave a shriek, he heard a few sighs, and all was still. He then got into the lobby, went to a window, and cried out for assistance. Some men brought a ladder and he escaped, with no other article of clothing save his shirt. When the water subsided, his wife and daughter were found in the bed, and it appeared as though the poor child had run to her mother for safety.

The next door neighbour, George Crossland, had a more marvellous escape. His family escaped, when he was caught by the water down stairs, which rose to the height of 7 feet in a few minutes. Fortunately, the room was still higher, and as he had learned to swim, he managed to keep his head above water for some time, but soon became thoroughly exhausted, and was nearly suffocated, and swam round the room in the vain hope of catching hold of something. At last he caught hold of a "sampler" hung up in a frame to the wall, and the nail

very fortunately having been hammered into the wall a little faster than usual, he managed to keep afloat until the flood passed away, and thus was rescued.

In another adjoining house occupied by James Booth, his wife, and a lodger named William Heeley, the whole family were lost.

In a house in the same street occupied by Jonas Wimpenny, a whole family of eight persons had a most marvellous escape. The oldest son, hearing the rushing of the water, wanted at once to open the door, but owing to the presence of mind of a member of the family he was prevented, and the door kept too until the whole family had escaped. The next moment the door was burst open by the flood. In all, 41 persons have met an untimely death at Hinchliffe Mill. Of these, all were washed away except seven. Their names are as follows :—

James Booth, and wife.

William Heeley.

Lydia Brook, and her daughter,

Elizabeth Dodd, and

A daughter of John Charlesworth.

None of the bodies appear to have been greatly mutilated.

The woollen mill is greatly injured. The lower windows are all stove in, and a considerable number of those in the second story have also been carried away. The water has swept through the machinery, doing much damage, and a considerable sum will have to be expended in repairing the mill-dam. The mill being broadside across the valley, a great amount of wreck was lodged against it.

HARPEN AND VICTORIA MILLS.—Progressing lower down the stream, we come to Harpen Mill, occupied by Messrs. Barber and Co.; and Victoria Mill, occupied by Messrs. Harper and Co. At the latter place three dwelling-houses were entirely washed away; but fortunately the inmates escaped. Both mills have suffered great damage.

SANDFORD MILL.—This Mill was occupied by Messrs. Sandford and Co.; on the left-hand side of which a small mansion had been erected, and was occupied by Jonathan

Sandford, jun., Esq.: his family consisting of two daughters, (the one about ten, the other five years of age), and his house-keeper. The house was completely swept away, and nothing left standing except a portion of one of the walls. It is said that Mr. Sandford had been informed the evening previous that a report had spread about the unsafe state of the reservoir; and that it would be hardly safe for him to sleep at home; and it is rumoured that he did not believe there was sufficient danger to justify the removal of his whole family; he therefore retired to rest with them; but not one now remains to tell the events of that terrible night! Such a tragic event has created an unusual amount of sympathy in the neighbourhood; which was not a little heightened by the almost frantic offers of reward to any amount by his distracted father (who resides in the neighbourhood) for the recovery of any of the bodies. According to our latest reports only one of the bodies had been discovered, and with numberless others

the rest may have been washed out even to the sea, the rivers being so greatly swollen by the late heavy rains. Not a particle of the property has been found, that we are aware of, except a deed of some property belonging to Mr. Sandford, which was found embedded in Mr. Floyd's garden. Two houses in the immediate vicinity of Mr. Sandford's residence, were also swept away, but the inmates were saved.

UPPER AND LOWER MILL.—The mill called Upper Mill, occupied by Mr. John Farrar, was washed into, the engine greatly damaged, the whole of the dyehouse nearly swept away, and a great amount of "mungo" or "devil's dust" carried down by the flood. In addition to the injury done to the machinery, Mr. Farrar has sustained a still more serious loss. On Wednesday he had payments made to him amounting to nearly £700, which he had deposited in his counting house. The whole of this amount was swept away.

At Lower Mill, occupied by Mr. J. H. Farrar, nearly all the windows were

broken, the machinery greatly damaged; and what is remarkable, the boiler was lifted clear off its seat and carried away, rolling on the surface of the water like an immense porpoise. How far down the valley this boiler was carried we have not ascertained; but several boilers have been left high and dry in the fields by the retiring waves. The mill dam was also burst.

It appears that some person had run down the valley when the embankment first gave way to give an alarm, for in the neighbourhood of Lower Mill or Upper Bridge several young men who were returning from Holmfirth met a young man who was running and crying "flood, flood;" but was unable to utter one single syllable more. Mr. Tedbar Earnshaw and Mr. Geo. Littlewood, in company with some others met this young man at Holmfirth, and by a sort of instinct at once concluded that the reservoir had burst, but the young man who thus brought the alarm sank thoroughly exhausted to the ground.

Upon the strength of the supposition they had come to, they commenced kicking at all the doors, and in less than five minutes the flood was upon them. Earnshaw says that he saw a bed with two little children in it come out of one of the houses, and roll down the stream; the shrieking children were lost. Mr. Littlewood says that he handed about 20 women and children out of houses, and knocked up several of the inhabitants who in the utmost consternation and bewilderment beheld their dwellings surrounded by water.

HOLMFIRTH.—The first news of the fearful doom which had befallen so many of the inhabitants in the Holme valley, and of the terrible approach of the flood, reached Holmfirth about half-past 1 o'clock, and we believe the two parties just alluded to along with one or two of their companions, were the first to rouse the inhabitants; at all events they acted in a praiseworthy manner in their heroic exertions to save life and property.

Among others whom they aroused was Mr. Lomax, surgeon, who upon running to his bed-room window was horror-struck at seeing the water surging in the road beneath. Looking across the valley he saw the toll-bar house carried away at one fell swoop. Thinking it time to escape, he and his wife and family managed to squeeze themselves through one of the windows on the back part of the house, and ascended one of the neighbouring heights for security.

Perhaps the most affecting spectacle which the dawn of the morning revealed in this valley of desolation was the number of dead bodies, and especially females, which were laid in the mud and upon the banks of the river. They were all carefully removed by the special constables and others engaged for the occasion, and taken to the nearest public houses.

Considerable damage was done at Upper Bridge, where the valley is very much confined. The door of a dwelling-house, occupied by a poor man named Joseph

Hellawell, was burst open by the destructive current. He was in bed at the time with his wife ; his four children were also asleep in bed. Hellawell made his escape by climbing into an upper room, from whence he was taken into another dwelling by the inmates and saved. His wife and four children were all drowned. In the next house two children, named Alfred and Sarah Woodcock, were drawn into the current, and perished. A house adjoining the bridge, occupied by Enon Bailey, was swept away, and his wife and children carried away. The toll-bar house in Hollow-gate, kept by Samuel Greenwood, was entirely swept away ; and the inmates, three in number, drowned. Two houses a little lower down the river, occupied by Mr. Ashall and his family, were completely carried away, not a vestige remaining ; the family, five in number, were all lost. In an adjoining house two females named Kaye were drowned.

In Victoria-street the work of devastation was equally great ; every building in

that recently erected street being literally deluged with water, and the goods of every shopkeeper damaged to a serious extent. It would occupy the whole of this book to enumerate the various amounts of damage sustained by each individual shopkeeper and inhabitant, inasmuch as this terrible visitation has involved nearly the whole of the village in indiscriminate ruin. We may mention a few cases in Victoria-street. A young man of the name of Edward Williamson, was just about commencing business as a linen draper in this street, and for that purpose had purchased goods to the amount of £700. They were partly unpacked on the evening of Wednesday, but on Thursday morning all washed away. The shop of Mr. Woodcock, draper and tailor, Victoria-street, completely devastated of its contents, and the stock, said to be worth nearly £700, carried away. The premises of Mr. Gutteridge, confectioner, and those of Mr. Dyson, druggist, in the same street, also sustained consid-

erable damage. A portion of the premises of Mr. Charles Boocock, who recently commenced business as a grocer and provision dealer, were swept away, and various kinds of provisions rendered unsaleable. Mr. Lawson, tinner, and Mr. Harrison, grocer, have each had their stocks damaged to the extent of £100.

At the end of Victoria-street, two houses, occupied by Mr. Whiteley and Mr. Marples, were partially destroyed. The inmates, ten in number, escaped by means of a skylight on to the roof of the houses, and were rescued by means of ladders.

In Town Gate the water entered the premises of Mr. Garside, ironmonger, and caused damage to the extent of between £200 and £300.

A warehouse, occupied by Mr. Bower, at Holmfirth Mill, was clean swept away. It is estimated that wool to the amount of £2000 was stowed in the warehouse at the time it was washed away. A portion of the mill was also destroyed, and the machinery damaged to a dreadful extent.

The engineer, or foreman (Mr. Sidney Hartley), and his family, consisting of eight children, were lost; thus adding another family to the terrible list of families swept away by this awful catastrophe. The next house swept away was occupied by Richard Shackleton. The family consisted of four persons, all of whom were swept out of their beds in a moment, and carried down the valley. The dye-house and other outbuildings were completely demolished, and a person of the name of Lee, who resided in his own dwelling house in the neighbourhood, was also drowned. The rest of the inmates had an hairbreadth escape.

Great damage was done to the Church, and also to the Wesleyan Chapel. Several graves were burst open in the grave yard attached to the Wesleyan Chapel, and coffins were floated away from what had been considered to be their last resting place.

At Cuttle Bottom, a most miraculous escape is stated to have taken place in a

dwellinghouse adjoining Mr. Wimpenny's house, in which a servant of Mr. Floyd's solicitor, and a little boy was sleeping. When the water rushed into the house, the man seized hold of the boy and made for the staircase; but just as he reached the door, it was closed by the force of the water, and the boy was separated from him. As a matter of course it was expected that the boy was drowned. It turned out, however, that the little fellow, when borne up by the force of the water, had caught hold as with a death-grip, of one of the joists, and held fast for a weary long hour, until the water subsided, when he made his escape.

At Bridge Mill the force of the current washed down the embankment of the dam, doing considerable damage to the mill and machinery. A building at Bridge Fold, occupied by Mr. Exley and his family, was completely destroyed, and the inmates pulled out of the house before it went to complete ruin. Their escape is miraculous. The harrowing recital of

scenes which will never be effaced from the memory of those who witnessed them, might be continued to an indefinite extent, but we are obliged to limit our description.

Several of the magistrates had a narrow escape of their lives. The residences of Messrs. Charlesworth and Moorhouse were greatly damaged, the boiling and foaming waters literally surrounding their houses for some time. They were all ultimately rescued.

At Thongs Bridge Mill the water effected an entrance, and did immense injury to the machinery and the property deposited therein. The scene of devastation in this neighbourhood beggars description. The torrent forced its way through the lower part of the mill of Messrs. Wimpenny and Woodhead, situated on the opposite side of the river, and destroyed the dry-house and other buildings. An affecting incident occurred at this place. The cottage of the engine man, attached to the premises, was filled

with water; and, finding his position to be one of great danger, he rushed to the window, for the purpose of effecting his escape, when it at once flashed across his mind that he had left his child behind. Fortunately, he observed the little fellow floundering about, and grasping him by the arm, saved his life.

HUDDERSFIELD.—Below the immediate neighbourhood of Holmfirth, the whole line of the river is one scene of wreck for many miles; as the course of the river is pursued, scarcely a field, garden, or building on its confines but has suffered more or less. At Smithy-place, the dyehouse and mill of Messrs. James Robinson has suffered severely, part of the dyehouse with its contents being washed away; at a rough calculation, the damage done is about £1,500. The strong walls on the road side and surrounding many of the gentlemen's houses on the Honley Road, are razed to the ground, and the houses at the lower part filled with sludge and

sand. At Steps Mill, some ravages have been sustained; and at the mansion of John Brooke, Esq., Armitage Bridge, considerable damage has been done, his entire pleasure-grounds and gardens being buried in water for several feet.

At Lockwood, the gardens of Mr. Thewlis, are again a scene of complete wreck. The force of the waters appears to have cut up every thing in the grounds. The loss to this poor man is somewhere between one and two hundred pounds. The most singular circumstance is, that this is the second disaster he has sustained at his garden; on that very day two years since, his entire grounds were destroyed by a storm of wind and hail, he was but just recovering his loss, by the aid of a liberal public, when this second calamity has again blighted all his hopes and prospects.

At King's Mill, such was the force of the torrent, that a new bridge was torn up, which had lately been erected

at considerable expense, by Mr. James North, for his own convenience, in running by a tram road, his grain, &c., from the Canal across his field and to the mill, without the slow process of having the whole to cart from the Canal warehouse. This bridge was swept away like match or cork wood, and a large portion of it was found, during the forenoon, down below Mirfield. The stout and strong piers, of solid masonry, supporting the recently erected bridge leading from the new road and Commercial Street, to King's Mill, erected at considerable expense by the trustees, were swept away as if it had been a loose brick kiln, and the bridge now hangs like a half broken reed, and is dangerous to pass over. Several other bridges, &c., below, have suffered materially, and men were engaged nearly the whole day up to their breasts in water, at various parts of the stream, fishing out those portions of wreck they could get hold of.

At Mirfield, the bank was one heterogeneous mass of broken furniture, wearing apparel, parts of buildings, and every other moveable or floating article. At an early part of the day, a very handsome piano-forte was got out, and the next article was a press bedstead complete. The bodies of two horses were seen to go over the dam stones near the station; and they were followed by the carcasses of pigs and cows. Early in the morning, the body of a young woman was taken out near to Low Mills. She was in a state of nudity, was apparently about 22 years of age, and had a ring on the marriage finger. We are informed that somewhere about £20 of property was fished out of the river in the course of the day.

LIST OF THE BODIES FOUND.

It is to be regretted that no official list should have been drawn up of the number of bodies missing. The following is an authentic return of the bodies found, and of their names as identified before the Coroner:—

- 1—Rose Charlesworth, aged 40, wife of John Charlesworth, of Hinchcliffe Mill, clothier.
- 2—Ellen Ann Hartley, aged 2 years, daughter of Sidney Hartley, of Holmfirth, engineer.

The inquest was held over the female child by the above name. It was first stated to be one of Metterick's daughters. Subsequently the little girl Hannah, daughter of Sidney Hartley, came forward to identify it as the body of her sister Ellen. She was asked how she knew it, and replied, because it was "calf licked," like herself—pointing to a peculiarity of the hair on the forehead—so denominated in Yorkshire. The Coroner took her deposition, but afterwards the same child was claimed by a man named Bailey as his daughter, and he ultimately obtained possession of the corpse, and interred it.

- 3—A boy unknown, aged about 5 years.

- 4—Martha Hartley, 16 years, daughter of Sidney Hartley, of Holmfirth.
- 5—Charles Thorpe, 3 years, son of Matthew Fearn mason, of Holmfirth.
- 6—Betty Heely, 7 years, daughter of Thomas Heely, labourer, of Smithy Place Hill.
- 7—A boy unknown, aged about 6 years.
- 8—Mary Ann Hartley, 39 years, wife of the said Sidney Hartley, of Holmfirth.
- 9—James Hartley, 14 years, son of ditto.
- 10—Jane Metterick, 3 years, daughter of James Metterick, clothier, of Holmfirth.
- 11—A boy unknown, aged about 4 years.
- 12—William Metterick, 26 years, manufacturer, Hinchcliffe Mill.
- 13—A daughter of the said Matthew Fearn, aged 6 months, of Holmfirth.
- 14—Hannah Bailey, 40 years, wife of Enos Bailéy, of Holmfirth.
- 15—Hannah Shackleton, 9 years, daughter of Richard Shackleton, joiner, of Holmfirth.
- 16—Infant child unknown, supposed to be Hannah Bailey's.

It was erroneously reported that this child had been born in the water; but it bears evidence of having been alive for a few days, and dressed. It is said that Enos Bailey had some difficulty in identifying his wife, owing to the changed features through drowning, and that he only became assured of her identity by a particular mole upon her person.

- 17—Joshua Earnshaw, 70 years, of Water Street, Hinchcliffe Mill.
- 18—Tamer Shackleton, 33 years, wife of the said Richard Shackleton.
- 19—James Shackleton, 1 year, son of ditto.
- 20—Elizabeth Hartley, 4 years, daughter of the said Sidney Hartley.
- 21—A girl unknown, aged about 2½ years.
- 22—Hannah Crosland, 19 years, daughter of Jonathan Crosland, clothier, Hinchcliffe Mill.
- 23—Ellen Wood, 22 years, servant.
- 24—James Charlesworth, 14 years, son of the said John Charlesworth, clothier, Hinchcliffe Mill.
- 25—Alfred Woodcock, 17 years, son of Richard Woodcock, dyer, of Holmfirth.
- 26—Ruth Charlesworth, 1 year, the daughter of the said John Charlesworth.
- 27—Emily Sandford, 3½ years, daughter of Jonathan Sandford, of Dyson Mill, manufacturer.
- 28—Sidney Hartley, 41 years, engineer, of Holmfirth.
- 29—George Hartley, 10 weeks, son of the said Sidney Hartley.
- 30—Charles Earnshaw, 30 years, clothier, Hinchcliffe Mill, son of the said Joshua Earnshaw.
- 31—John Ashall, 32 years, currier, of Holmfirth.
- 32—Margaret Ashall, 30 years, wife of the above.
- 33—Sarah Jane Sandford, 9 years, daughter of the said Jonathan Sandford.
- 34—Martha Crosland, 17 years, daughter of the said Jonathan Crosland.

- 35—Joe Metterick, aged about 12 months, son of the said James Metterick.
- 36—A female child unknown, about 4 years.
- 37—Amelia Fearn, 30 years, wife of the said Matthew Fearn.
- 38—Joshua Charlesworth, 16 years, son of the said John Charlesworth.
- 39—A boy unknown, aged about 11 years.
- 40—Eliza Marsden, 46 years, single woman, Hinchcliffe Mill.
- 41—James Lee, 65 years, tailor, of Holmfirth.
- 42—Joseph Marsden, 16 years, son of the said Eliza Marsden.
- 43—William Exley, 26 years, Hinchcliffe Mill (insane).
- 44—Eliza Matthews, 12 years, daughter of David Matthews (in the asylum). She lived with Samuel Greenwood, of Hollow Gate.
- 45—Lydia Greenwood, 45 years, wife of the said Samuel Greenwood, bar keeper.
- 46—Abel Earnshaw, 6 years, son of Enos Earnshaw (who is gone to America).
- 47—Jonathan Crosland, 39 years, clothier, Hinchcliffe Mill.
- 48—Joshua Crosland, 21 years, son of the above.
- 49—Mary Helliwell, 28 years, wife of Joseph Helliwell weaver, of Holmfirth.
- 50—George Helliwell, 9 years, son of ditto
- 51—Sarah Helliwell, 6 years, daughter of ditto
- 52—Elizabeth Helliwell, 4 years, daughter of ditto
- 53—John Helliwell, 2 years, son of ditto
- 54—Ann Helliwell, 10 months, daughter of ditto

- 55—Hannah Dodd, 30 years, wife of Joseph Dodd, engine tenter, Hinchcliffe Mill.
- 56—James Booth, 60 years, labourer, Hinchcliffe Mill.
- 57—Nancy Booth, 44 years, wife of the above.
- 58—William Healey, 45 years, labourer, Hinchcliffe Mill.
- 59—Lydia Brooke, 28 years, wife of Joseph Brooke, of Hinchcliffe Mill.
- 60—Hannah Brooke, 11 years, daughter of the above.
- 61—Elizabeth Dodd, 7 years, daughter of the said Joseph Dodd.
- 62—Nancy Marsden, 53 years, single woman, Hinchcliffe Mill.
- 63—Sarah Hannah Dodd, 17 months, daughter of the said Joseph Dodd.
- 64—Charles Crosland, 13 years, son of the said Jonathan Crosland.
- 65—Foster Crosland, 7 years, son of ditto
- 66—Sarah Woodcock, 12 years, daughter of Richard Woodcock, dyer, of Holmfirth.
- 67—Samuel Greenwood, 46 years, toll-bar keeper, Hollow Gate.
- 68—Ann Earnshaw Beaumont, 14 years, lived with her grand-father, the said Joshua Earnshaw.
- 69—Betty Earnshaw, 25 years, wife of Enos Earnshaw (who is gone to America). She resided with her father, James Metterick, of Water Street, Hinchcliffe Mill.
- 70—Alfred Ashall, 2 years, very stout fine child, eruption about one eye, rather light hair.
- 71—Samuel Metterick, 20 years, Water Street, 5ft. 7in.. slender, and long in his limbs, thick upper lip, and dark brown hair.

72—Jonathan Sandford, 45 years, Dyson's Mill, 6ft. stout, round shouldered, sandy hair and whiskers, slightly pock-marked, and very bald on the top of the head.

73—Grace Hirst Shackleton, 4½ years, Holmfirth, small, dark brown hair, and a slight scar from a burn, on the side of her neck.

This makes SEVENTY-THREE bodies (not including the one said to have been born in the water) found up to the time we are at press. The following are the descriptions of the other bodies lost, and which, if amongst the unknown bodies above given, are not fully identified:—

Joseph Marsden, 19 years, Water Street, sandy hair fresh and good looking.

Joseph Dodd, 48 years, Water Street, low in stature, very thin, large nose, sandy hair and whiskers, and bald on the top of the head.

Mary Crosland, 19 years, Water Street, middle size and very thin, pale looking, dark brown hair.

James Metterick, 57 years, Water Street, 5ft. 8in., stout good looking, very bald head, and grey whiskers.

Mary Metterick, 38 years, rather tall, moderately stout, slightly pock-marked, lost all her front teeth on the top side, except one, and a blue mark over one eye.

Alfred Metterick, 8 years, Water Street, very slender, strong light coloured hair.

Hamer Charlesworth, 6 years, Water Street, slender, very light coloured hair.

Richard Shackleton, 31 years, Holmfirth, 5ft. 9in., brown curly hair, dark eyes, and a brown mark on one arm, between the wrist and elbow.

Ellen Ann Hartley, 3 years, Holmfirth Mill, light coloured hair, very much turned up in front.

Ann Bailey, 4 years, Upper Bridge, not tall, but stout, thick dark hair, a little scorbutic eruption on one eye, with lindsey night-gown.

LOSS OF PROPERTY.

Some idea may be formed of the loss of property when it is stated that there have been *wholly destroyed*, 4 mills; 10 dye-houses; 9 stores; 27 cottages; 7 tradesmen's houses; 7 shops; 6 bridges; 1 county bridge; 10 warehouses; 8 barns and stables; total, 89.

BUILDINGS SERIOUSLY INJURED.—
There have been 5 dye-houses; 17 mills; 3 stores; 129 cottages; 7 tradesmen's houses; 44 large shops; 11 public houses; 5 bridges; 1 county bridge; 4 warehouses; 13 barns; 3 places of worship;

2 iron foundries; total, 244.—Also 200 acres of land. 4,896 adults and 2,142 children have been thrown out of employ, making a total of 7,038. The average weekly earnings of these were £3,748. The total number of persons dependent on the property destroyed is 10,000. The damage is estimated at from £200,000 to £250,000.

ADDITIONAL PARTICULARS.

Repeated personal observations and calm enquiry have enabled us to collect many interesting details of this calamity in addition to the previous ones. The little lapse of time which occurred since the accident added to the distracted condition of the inhabitants of the valley, rendered it impossible for us to obtain a full account of the flood down the entire length of its devastating course. By dint of great labour, and personal interviews with eye-witnesses of the course of the

flood as far as Holmfirth, we have been able, however, to give a connected narrative down to that place, the accuracy and fullness of which may be depended upon. We now resume our narrative at that point, in order to make it a complete record of this distressing and unprecedented event; but before doing so will add some remarks on the reservoir and the course of the stream, embodying additional details.

THE COURSE OF THE FLOOD.

The wonder excited in the mind of the reader that a reservoir so comparatively small should do so much damage, vanishes with a very cursory inspection of the locality. The entire Holme valley is a striking instance of British enterprise. On scites, apparently the least adapted for their object, mills, manufactories, shops, and dwelling-houses have been erected! the owner of each actuated only by con-

siderations of his own means and requirement; and yet all these isolated efforts combining to congregate and employ in the narrow valley of the Holme a large and industrious and hitherto a thriving population. With a striking disregard for the dangers of great floods, but a singular fear of little overflows, the Holme lands upon the wider expanses of the valley are rairly the scites of either mills or dwelling-houses. But, where the valley contracts to a gorge, and the stream deepens as it narrows, there the little space by the side of the stream is blocked-up with a mill, and a row of cottages with their "wall-race" in the very bed of the stream perched on the precipitous bank on the other side which did not allow room for another mill. It was at these gorges, thus obstructed by buildings, that the loss of life and property occurred. And hence it is, that although the embankment of the reservoir burst to its very base with one tremendous roar, pouring out its millions of gallons of

water so fast as to empty the whole in little more than a quarter of an hour, the flood down at Holmfirth is described by some as coming in three successive surges. The chasm in the embankment being on the side furthest from Bilberry mill, and the valley widening on that side, that mill did not sustain the full force of the flood. Its tremendous force is, however, shown about a quarter of a mile down, by two large rocks, the least weighing four or five tons, which have been carried there and left "high and dry" on the flat land at the back of Mr. Fourness's house. The house itself which would be nearly in the middle of the flood has received little injury; but the mill below is damaged on one side. The valley then narrows rapidly, the brow on each side becoming perfectly precipitous; and this was the spot selected for the erection of Digley mill, on the right bank of the stream, and the further entire blocking-up of the valley by a large weaving shed on the left side of the valley. Here the water

was pent-up for a short time until it had attained depth enough to force down the obstruction; and the description of this process as that of the entire premises melting in the boiling liquid, exhibits the process of such a destruction. The mill on the right hand was four stories high and forty yards long, set broad-way to the coming flood; and the buildings on the left consisted of a weaving-shed, dye-house, and the residence of the owner, Mrs Hirst. Of these all are swept away except the chimney; but we could see no marks upon this standing relic to show the height to which the waters had risen before the premises melted beneath them. From Digley the valley continues to be a narrow glen until it approaches Holme bridge. Half way down is the Bank-end mill, on the left bank of the stream; but as there is no obstruction on the other side, and the stream has here a rapid fall, only one end of the mill has been swept away.

At Holme Bridge, the greater part of

the bridge (which belongs to the Huddersfield and Woodhead turnpike road) is swept away; and the church flooded. But, as the valley here widens, the flood was again weakened by its being spread. Approaching Hinchcliffe Mill the river is crossed by a bridge, a mill-dam on the right bank encroaches on the stream, until the space left for the exit of water is only some 15 yards; the edge of the stream on the left bank being formed by the "wall-race" of the six cottages, which formed the lower part of Water Street. Into this narrow space, the boilers, machinery, and timber, which had been brought by the furious flood all the way from Digley Mills, were driven. The houses in Water Street were three stories high; and the wreck was driven against the second story, blocking up the stream, which pressed with the force of hundreds of tons behind. The affrighted inhabitants fled from the lowest to the second, and from the second to the top story. According to some accounts six of the inhabitants

escaped at that time. The whole of the six cottages were then pressed outwards by the collected wreck, and fell, so to speak, upon their backs in the street behind. And all the living souls, but one, then in the houses were swept away, only to be picked up mutilated corpses. That one, James Metterick, escaped under circumstances to which we have previously alluded. He has been the object of great curiosity ever since. He states that there were ten of them in the house when the flood came, viz., his father, step-mother, and eight children. On being awaked he put on some of his clothes and ran to the window, where he met with his step-mother; and they both at once saw that the reservoir had burst. The other children were at this time below, but his father handed them up, and they were placed in the chamber. Just then the deluge came, and the water burst through into the chamber. He and Mrs. Metterick again seized the children, and carried all but one into the attic, a story higher:

the flood caught his father and one child on the stairs and drowned them. The next moment the whole house was carried away, and he saw no more of the family: he found himself in the raging torrent, swept before it for a quarter of a mile like a feather. He got hold of a floating plank, lost it, and seized another: was carried aside into the Bottom Mill Reservoir, where the water soon became quieter, and he paddled himself to the side by means of another floating piece of wood which he seized.

From Hinchcliffe Mill, the valley again widens; and in this reach, two boilers are deposited, one of which had been brought all the way (one mile) from Digley Mill.

Victoria Mill on the left bank of the stream, and the mill-dam to Dyson's Mill again contract the stream, and caused the destruction of three cottages built (in the disregard of danger to which we have already adverted) close to the water edge, and of the house occupied by Mr. John Sandford, junr., and his family, which was built close under the mill-dam.

After another expanse the stream is once more obstructed by the Lower Mill on one side, and the houses at Scarr Fold on the other ; and from this point to the lower end of Holmfirth, the river was literally "throttled" with buildings. On the mill end above Scarr Fold, there are marks which seem to indicate a height of more than 20 feet above the stream which was running this week. Scarr Fold itself, consists of the lower stories, which face towards the stream, of houses the upper stories of which abut upon the high road. A number of steps lead down to the fold ; and as if to court the greater danger, at the bottom of the passage, one of a row of houses standing sideway to the stream, projects further than the neighbouring fronts. The flood has swept this house clear away ; but the occupants (Mr. John Charlesworth, his wife and two children) being alarmed, made their escape up these steps. At the second house from the stream, occupied by Richard Woodcock, two lives (child-

ren) were lost. Woodcock with two of his children escaped, leaving his wife and other two children to follow, but the children were caught and carried away. In the row of houses below this place, all the inhabitants escaped except in one house, occupied by Joseph Helliwell, weaver, and his family. They it appeared slept in the bottom room. Helliwell himself had only just time to run up stairs; his wife and five children were drowned in their beds; and Helliwell himself was only saved by being dragged through the floor of the house above.

Next comes the Upper Bridge, which stood the shock remarkable. On the left bank another house, occupied by Mr. Enos Bailey, his wife, and two children, projected towards the stream, and was carried away by the flood. His wife and children were all drowned; but he laid hold of a beam which was being carried down the stream, and which, by a sudden sweep, brought him again to the left bank of the river, and he was able to scramble

out and escape into the turn-pike road by the gate near the house of Mr. S. Wimpenny, grocer. Mr. Wimpenny sustained damage to the amount of £200; and we ought also to mention that near Upper Bridge damage was done to the stock of Mr. Haigh, grocer, to the amount of £600; to the house of Mr. James Charlesworth, banker, to the amount of £300; and to Mr. G. Bower, the King's Head Inn, to the amount of £70.

But it was on the premises below, and on the opposite side of the point to which we have now brought our narrative, that the most serious mischief visible in Holmfirth was done. The Upper Bridge was dismantled, and very soon overflowed. The whole of the houses ranging on the right-hand side of the river forms a long street called Hollow-gate, and suffered severely from the inundation. The Elephant and Castle, occupied by Mrs. Kippax, and situated on the right-hand side of the bridge, was damaged to the extent of £200; and a butcher's shop adjoining,

kept by Mr. H. Bowers, to the extent of £50. A row of shops, three stories high, a little lower down, were more or less injured, and much property destroyed. Messrs. B. and E. Woodhead, Grocers, estimate their loss at £60; Mr. Abraham Haley, grocer, at £50; Mr. H. Swire, Clogger, at £40; Mr. M'Clellan bookseller, at £400; Mr. Briggs, Greengrocer, at £20; Mr. J. Morehouse, tailor, at £10; and Messrs. Joel Haigh & Son, drapers, at £600. The bed of the river at this point was completely choked up with the accumulated ruin of mills and houses, and the current was therefore somewhat diverted from its usual course. The residents in the houses already named in this immediate locality, happily escaped with their lives; but the most tragic scenes occurred to the inhabitants of some houses on the opposite side of the street, the foundations of which are now washed by the river. On the left-hand side of what the day previous was a narrow street, stood a toll-bar house kept by S. Greenwood, who, with

his wife and child, were swept away. He was seen by some neighbours, who had been awakened by the roaring of the torrent, to come out of doors with a lighted candle in his hand—no doubt to ascertain what was the matter. He returned into the house, closed the door, and in a moment or two not a vestige of the toll-bar house could be seen. A little lower down, on the same side of the street, an extensive warehouse, occupied by Messrs. Crawshaw, curriers, was swept away by the flood, as also a cottage in which a person of the name of Ashhole resided, who, with his wife and child perished. Another cottage adjoining these premises met a similar fate. It was occupied by a labouring man, named John Kaye, with whom lived his son-in-law and daughter with their child. The three latter were drowned, while a remarkable deliverance awaited the old man. He was driven by the force of the current into Victoria-square, on the opposite side, and a little lower down the street. He was espied floating on the

water by the landlord of the Rose and Crown Inn, who at once stretched out a pole to the drowning man, and rescued him from almost certain death. An extensive warehouse, barn, stable, &c., on the same side of the street, belonging to Mr. J. Morris, manufacturer, was also destroyed.

On the other side of the street where these premises and cottages once stood, some hair-breadth escapes were effected. The premises occupied by Mr. T. Ellis, plumber and glazier, are elevated from the road, and ascended by a flight of steps. Nevertheless, such was the sudden and great rise of the flood that the inmates who were sleeping in the upper story were placed in great jeopardy. Mr. Ellis made his escape by forcing open a small portion of the ceiling of the workshop with a crow-bar, and by this means got into one of the houses on the hill side. Richard Tolson (a workman with Ellis, and who lived on the premises), his wife, four children, and James Roberts, a lodger, seeing the water already up to the lower ledge of their

bed-room, and having witnessed the destruction of the three houses opposite, went up the narrow and contracted bedroom chimney, and providentially got into another house higher up the hill side. The inmates of the adjoining house, occupied by Mr. R. Parsons, escaped out of the back door; the house was gutted and damage to the amount of £10 sustained. Mr. B. Burton, plumber, and who also occupied adjoining premises as a toy warehouse, was damaged to the extent of £690. The next building was a small stable occupied by Mr. H. Firth, whose horse had been put-up in it the night previous. The front of the stable being washed away the horse was carried down the river, but when opposite the White Hart Inn managed somehow to get out. The affrighted animal galloped right away to the top of the hill. Nearly opposite this stable there stood a grocer's shop, occupied by Mr. H. Firth, and a small house, occupied by Mr. Abel Hoyle, both of which were washed away bodily. Fortunately the tenants did not reside upon the premises.

At Rotchet (a continuation of Hollow Gate) much damage was done. Mr. Joseph Haigh, butcher, sustained damage to the extent of £20, and Mr. Jonathan Butterworth, butcher, £40. Mr. James Lee, tailor, who lived next door perished; and the only wonder is that the house did not come down. Lee and his grandson Job were down stairs at the time making black clothes for a funeral. The flood burst open the door and the old man unable to help himself was drowned. Job managed to swim about the house, and fortunately his cries were heard by a man named Benjamin Brearley and his wife, who lodged in the house, and were asleep upstairs; they immediately ran to his assistance but found themselves unable to open the chamber door; with their feet, however, they managed to force one of the panels, and through a small aperture of only 5 inches square, pulled Job by the head and shoulders. Mr. Robert Castle, grocer, had a narrow escape. The old man said "the water came right up into my cham-

ber, and I could dabble my fingers in it as I lay in bed." Fortunately it subsided, but not before doing damage to the extent of £20. The Ribble runs in front of this house, and shortly after falls into the Holme. The battlements of the bridge were washed away. Not much damage was done to the Rose and Crown Inn; but Mr. Walker, tailor, of Hinchcliffe, sustained a loss of £10, and the next premises occupied by Mr. Blakey, tailor and draper, were completely gutted. The damage was estimated at £600, and the remainder of the goods have since been sold off. Mr. Watson, chemist, sustained a loss of £300, and Mr. John Johnson, tinner, of £300, while the loss of Mr. Wood, grocer, is estimated at from £1000 to £1500. Mr James Haigh, of the Shoulder of Mutton, estimates his loss at £200; and Mr. Joseph Balmforth, painter, at £100. Adjoining the bridge on the opposite side of the street, was the dwelling-house of Mr. Charles Marples, ironfounder, but whose wife kept a milli-

ner's shop. The family fortunately escaped, but only the front wall and a portion of one of the gables of the house is left standing. A portion of the next house occupied by Mr. William Day Martin, clock and watch maker, has been swept away, and the building is completely gutted. He estimates his loss at £200. A similar fate befell Mr. James Whiteley's house, shoemaker, whose loss is said to be £1,000. The family had a narrow escape out of the windows. Mr. James Garside, ironmonger, of Church Street, suffered a loss of a £100 to £200; Mr. Samuel Woodhead, shoemaker, of £20; Mr. William Cartwright, of the Jolly Hatters, of £20; Mr. Francis Vero, hatter and draper, £100; and Mr. James Boothroyd, draper (whose shop is far up in the church yard), £250.

We have now brought our peregrinations to the old church, which has not sustained any very serious damage, but a most remarkable proof is afforded in

the church-yard of the amazing force of the flood. One of the massive pillars of the gateway has been lifted from its bed, twisted half way round, and yet, singularly enough, left to maintain its perpendicular. A small triangular house at the end of Mr. Vero's shop was washed away. The resident escaped. Below the church Mr. Joseph Morris, painter, sustained damage to the amount of £10; Mr. Francis Gutteridge, confectioner, £40; Mr. John Dyson, tinner, £60; Mr. William Gledhill, grocer, £150; and Mr. William Dyson, White Hart Inn, £250. Mr. Dyson had a narrow escape, but the moment he was saved himself he set about rescuing the lives of his neighbours who were placed in jeopardy. Immediately opposite the White Hart stands a dwelling occupied by Mr. Shackleton, a retired publican. The water had already made sad havoc with it, and washed away the furniture, when Mr. Dyson made a desperate effort to rescue the inmates, and succeeded in

carrying them out of the house on his back; Mr. Shackleton's daughter and grand-daughter being in their night-dresses. The next house is inhabited by Mr. Joseph Whiteley, boot and shoe maker, who suffered a loss of £30; Mr. Joshua Mosley, grocer, of £100; and Mr. Benjamin Bailey, tailor, of £30. The house adjoining the White Hart is occupied by Mr. George Haigh, butcher, who had meat and furniture spoiled to the amount of £70. We now come to Mr. Howe's, the George and Dragon Inn, where some stabling was thrown down and the house damaged to the extent of £200. Mr. John Bower, of the Friendship Inn, also sustained a loss of £50, his house, like the rest, being flooded.

Turning to the left round the corner of the George and Dragon Inn we approach the extensive premises known as the Holmfirth Mill, belonging to Messrs. Nathan Thewlis and Co., and which was occupied as a scribbling, spinning, and

fulling mill. The mighty rushing torrent swept clean through the two lower stories, smashing the machinery, and inflicting an amount of damage which can not yet be estimated. Approaching the river and on the right hand side is a house occupied by Mr. John Roberts, who had a narrow escape. The house was gutted. A most appalling spectacle is presented on the brink of the river, and no pen can do justice to the scene of devastation which is there presented. On the opposite side stands the Wesleyan Chapel, with part of the grave yard washed away. Turning to the left we scramble over the ruins of some extensive blue dye works, formerly occupied by Messrs. John Roberts & Son. The destruction of these premises was most complete. Messrs. Bowers' wool warehouse adjoining, suffered damage to the extent of £1000. A little above the mill and between that building and a stable stood two small cottages; one occupied by Sidney Hartley (engineer to Messrs. Thewlis) and his

family; and the other by Richard Shackleton, weaver, and his family. Both these families, with the exception of three were swept away, and the cottages also. In order to shew that an alarm had spread even to Holmfirth that the Holme reservoir was not safe, we find that Mrs. Hartley (according to the narrative of one of her children—a girl—who was saved) having heard on wednesday night that it was likely to burst resolved not to go to bed. She, however, put her family of eight children to bed and sat up to await the issue, hoping to get sufficient warning to enable all to escape, if the report should prove correct. She sat up until one o'clock on Thursday morning, and then went to bed. The alarm reached almost immediately she had retired to rest, The girl states that the water burst upon them before they could get out of the chamber, and when her mother found they could not escape, she held up her infant child above the water outside the window, hoping to save it, but finding

the front of the house giving way she turned and bade her family farewell, and was swept away with the babe in the foaming torrent. So also perished the father and four other children; but the little creature who gives this narrative, with two sisters and the apprentice boy, who had also been sleeping in the house, being suddenly floated up to a part of the roof which yet remained, caught hold of the rafters and clung to them. When the flood began to abate, the apprentice, John Dearnley, got out upon the roof and assisted the three girls to do the same. Here they remained at least twenty minutes. He afterwards carried them one by one into the portion of Holmfirth Mills which had escaped destruction, where, in their night clothes, standing up to their knees in mud, they were exposed to the inclemency of the night air and to the falling rain. Ultimately, however, they discovered a way into a room nearly full of wool, and burying themselves amongst it obtained the warmth

they so much needed, and remained there till morning. The three orphans are now residing with their relations.

Victoria Bridge (like the other bridges) is dismantled. On the right-hand side, over the bridge, is a new row of shops, built in the modern style, every one of which was flooded to a greater or less extent according to their proximity to the river. The loss sustained by the various occupants is as follows :—Mr. Joshua Woodcock, draper, £700; Mr. Robert Gutteridge, confectioner, £250; Mr. John Hargreaves, shoemaker, £700; Mr Thos. Dyson, druggist, £100; Mr. Edwd. Williamson, draper, £700; Mr. John Bowcock, tea-dealer, £100; Mr. William Lawson, tinner, £50; and Mr. Richard Harrison, grocer, £30. Mr. Bowcock had only opened his shop the previous Saturday, and bills were posted on the shutters of Mr. Williamson's, to the effect that the shop would be open the Saturday following. The goods which were swept away had only just been deposited upon

the premises. What rendered the destruction of property in this street so very great, arose doubtless from the circumstance of cellar-kitchens being beneath the shops ; the immense weight of water seems to have broken down the floors the moment the shutters and windows gave way, and by this means washed everything out of the shops through the openings obtained in the back kitchens. Fortunately no loss of life was sustained in this street ; but most of the inmates escaped as by their very skin. Mr. Woodcock's family (being the occupants of the lowermost shop) had a most marvellous deliverance effected for them. They were awoke by the roaring of the waters, and seeing the flood rush past with such impetuosity, were naturally alarmed for their own safety. Mrs. Woodcock at last exclaimed, " I know a way of escape ; follow me." She immediately threw open the room window on the second story, and nothing daunted, stepped upon the narrow wooden cornice of the shop fronts,

and which is only some 14 or 16 inches in width ; upon this narrow ledge she ran in her night-dress to the top of the row, which consists of eight shops. Finding no member of her family following, she went back, exclaiming, "If I am to perish, I'll perish with my children, and we will all go together." As she was thus returning she fell through one of the room windows, but was rescued from her perilous situation, and both her husband and her children were also delivered from the horrible death which at one time seemed inevitable. On the opposite side of the street, damage to the amount of £2,000 was done to the extensive warehouses, dyehouse, and premises belonging to Joshua Moorhouse, Esq., J.P. In the rear of the shops in Victoria Street, and on the left-hand side as we progress along the course of the river, stands the mansion of Joseph Charlesworth, Esq., J.P. whose family and himself had a narrow escape, the house being at one time surrounded by water. The damage is estimated at

from £300 to £500. An adjoining barn, occupied by Joseph Battye, was inundated, and he lost a horse worth £18. The dwellinghouse and stable of Mr. Johnson, tinner, was flooded, and he lost a valuable horse, a pig, and a cow. A row of eight cottages in Norridge Bottom, facing towards the river, and belonging to Mr. Andrew Sanderson, narrowly escaped destruction. A widow named Bashworth was drawn out of the window of her house with ropes, and thus was saved. The rest of the inmates of these cottages also got away in safety. The Christian Brethren's meeting-room was considerably injured, and several of the benches swept away.

The Wesleyan Chapel comes next in the route we are taking. The injury done to the chapel has been noticed in a previous page, but we may here add, that, although the chapel stands firm, the earth has been washed away to the depth of several feet very near one corner. The chapel was flooded to within a foot of the tops of the pews. The preachers' houses are elevated

a few yards higher up, but the cellars were filled, and terror-stricken by the awful calamity, the Rev. B. Firth and the Rev. T. Garbutt, with their wives and children, ran out of their houses in their night dresses, and sought shelter on the hill side. A large tree, torn up by its roots, was left by the retiring waters in the back yard of one of the houses. Several strange sights are presented in the grave-yard, and perhaps the most singular is that occasioned by the whirling flood having scooped out the slumbering occupant of one of the graves, leaving a yawning gulph. Among the rest of the bodies washed away is that of the late Rev. Aaron Floyd. Several of the houses lower down the stream were injured, but not to any very considerable extent. The gas-works suffered damage by some of the mains being washed up. Messrs. Marples' iron foundry was also damaged to the extent of £50, and a large goit, which had been made at a considerable expense by Mr Joseph Broadbent, and

only recently completed, was swept away. The county bridge leading to the railway station was greatly damaged, and the battlements destroyed. A small mill called "Old Tom's Mill," situate on the other side this bridge, and which has latterly been occupied by Mr. John Wood, was washed away. Between this old mill and the church-yard little damage was done.

Below this county bridge, and immediately abutting on the right-hand side of the river, stood a cottage occupied by Mr. George Exley; the front wall of which was washed away, together with some out-buildings. The family had a narrow escape, having to be pulled out head foremost through a small window. Lower down still we come to Bridge Mill, occupied by Messrs. Broadbent. The teasing room was swept away, the reservoir bank partly washed down, and the machinery of the mill greatly injured. The battlements of a small bridge belonging to Mr C. S. Floyd were carried

away; and about a quarter of a mile lower down the valley the woollen mill and premises occupied by Mr. George Robinson, were greatly injured. The drying stove was taken away bodily, and a steam pan forced from its bed. In the fold adjoining, two cottages occupied by Hiram Earnshaw and Andrew Sanderson, were seriously damaged, and the furniture spoiled. These houses are built very near the river, and a large tree near them having withstood the fury of the element, in all probability saved the inmates from a watery grave. At Thongs Bridge a mill occupied by Messrs. Woodhead and Wimpenny, was greatly damaged; as was also the mill occupied by Messrs. J. & S. Mellor, of Mytholm Bridge, where the machinery was injured, and a cask of oil swept away. At Lower Mytholm Bridge, the mill occupied by Messrs. Bashworth and Booth, suffered in a somewhat similar manner to the rest, and several ends of cloth were washed away. The injury sustained by the millowners and inhabi-

tants lower down the valley having now been fully detailed we are enabled to close this somewhat minute account of the sudden ruin, and the effects of that dire calamity, to which the great manufacturing districts which environ Holmfirth have been subjected.

OPENING OF THE INQUEST.

HOLMFIRTH, FEBRUARY 6.—The excitement, consequent upon this heart-rending occurrence, yesterday, was of the most intense character. At Huddersfield, the railway station was literally besieged by a dense crowd of persons, of all classes, who evinced the greatest impatience to possess themselves of a ticket, for the purpose of going to view the scene of the dire calamity. The struggling and pressure was severe, and despite the utmost perseverance, great numbers were left behind. On the arrival of the trains, the parties dispersed themselves in groups,

and gratified their curiosity by examining those parts of the place which had been most exposed to the resistless torrent. The day being beautifully fine, the usually quiet village of Holmfirth presented an appearance of great animation, consequent upon the hundreds who thronged the various thoroughfares. The authorities, anxious to prevent accidents, caused a printed notice to be issued intimating that the bridges were in a very unsafe state, and cautioning the people not to assemble upon them in large numbers. So eager, however, was the multitude to accomplish the object of their visit, that this caution was wholly disregarded, but we are happy to say that no serious or unpleasant consequences followed the neglect of this timely injunction. We need scarcely say that a deep feeling of regret was manifested on the part of all who had an opportunity of witnessing the desolating effects occasioned by its awful visitation. The town hall was made a receptacle for such property

as had been found, which we need scarcely say was of a multifarious kind. In the course of the day a number of the magistrates attended, for the purpose of receiving information, and giving such instructions to police officers, and others who had been sworn in special constables, as might be deemed necessary. The following were present till the close of the proceedings, before the coroner: J. Charlesworth, Esq., Joseph Armitage, Esq., George Armitage Esq., William Leigh Brook, Esq., and Joshua Moorhouse, Esq. We may here state that a strong recommendation was given by the magistrates, to the public, through the medium of the press, not to contribute any money to the relief of the surviving sufferers, except through a properly authorised channel, which has been duly announced. This caution was necessary, in order that imposition might be prevented, and the sympathy of the public directed to legitimate objects. George Dyson, Esq., the Coroner, arrived in the morning, and ac-

accompanied by the gentlemen who had been summoned as Jurymen, were occupied several hours in the painful duty of viewing the bodies, which had been taken to the various public-houses in the village. Having fulfilled this necessary preliminary, they proceeded to the Town Hall, for the completion of the remaining forms. The following is a list of

THE JURY.

Mr. Godfrey Mellor, manufacturer, **FOREMAN**.
 Mr. Thomas Mellor, manufacturer.
 Mr. Thomas Moorhouse, gentleman.
 Mr. Thomas Dyson, manufacturer.
 Mr. James Brook, manufacturer.
 Mr. William Day Martin, clock and watch maker.
 Mr. Joseph Crawshaw, saddler.
 Mr. Charles Taylor, draper.
 Mr. Joshua Moorhouse, general dealer.
 Mr. John Burton, schoolmaster.
 Mr. Richard Bower, manufacturer.
 Mr. Joseph Crosland, stationer.
 Mr. John Wylie, schoolmaster.
 Mr. James Horncastle, manufacturer.
 Mr. David Brook, manufacturer.
 Mr. Thomas Hinchliffe, manufacturer.
 Mr. Ralph Carter, manufacturer.

These gentlemen having taken their seats, the **CORONER** expressed the deep

regret he felt in having to meet them on so melancholy an occasion. The loss of life as they were aware, was very fearful, and must excite a deep feeling of sorrow in the breasts of all. He might state at once, that he did not then propose to go into any evidence, because he thought that the public mind was hardly fitted for it, and because it would not be possible that such evidence as they would require could be brought before them in so short a time. He proposed to suit their convenience, and what he now suggested was, that the reservoir should be examined by some competent engineer, with a view to ascertain its original capability, and also, that the rules and regulations agreed to by the company of proprietors, might be referred to, for the purpose of ascertaining how far they had been observed, or otherwise. This would necessarily occupy some time. He should feel it his duty, moreover, to make a communication to the government, as they might think proper to send down an engineer of their own. The next

question was, to fix the day for holding the inquest, which he thought ought to be so far extended as to afford the fullest opportunity for such explanations as would satisfy the public, and particularly, the inhabitants of Holmfirth, with reference to the future condition of the reservoir. They ought to be satisfied that their lives and property would not again be placed in jeopardy, by any thing in the shape of neglect on the part of those who were more immediately concerned. It would be necessary for the Jury, in the discharge of their duty, to view the reservoir, in its present state. That would impose upon them the task of walking almost over the same ground again, but it was a duty which could not be dispensed with, and he believed that the Jury were quite ready and willing to devote to this painful inquiry whatever time and labour might be requisite.

FOREMAN.—I believe that every gentleman summoned is of opinion that we ought to view the reservoir, and to institute the

closest examination into the cause of this lamentable occurrence.

A conversation ensued with reference to viewing the reservoir, and the period of holding the inquest. The Foreman and a majority of the Jury expressed a wish to visit the place that afternoon, but one or two of the body objected, on the ground that they had already undergone sufficient fatigue. On this objection being urged, the Coroner observed that seventeen Jurymen being summoned, he might be able to dispense with the attendance of one of them, but it was of the highest importance that as many should attend as possible. Ultimately, the Jury determined to visit the reservoir on leaving the hall. It was then agreed that the inquest should take place on Wednesday, February 18th, at half-past ten o'clock, in the Town Hall, Holmfirth.

The Jury were then sworn to inquire into the death of Eliza Marsden, and this portion of the proceedings then terminated.

The adjourned inquest was held on Wednesday, February the 18th, and two following days, and by further adjournment, on Friday, February the 27th.

It will not be necessary to trouble the reader with the mass of evidence which was produced during the examination; the following valuable documents will amply supply all needful information, as to the *origin* of the reservoirs, and the probable causes of the bursting of the one called "The Bilberry Reservoir." The documents referred to, are the history of the undertaking given at the inquest, by Mr. Jacomb, law clerk, and by Mr. Leather, late C. E. to the Commissioners; also, the Coroner's summing up,—the Verdict of the Jury,—and the report of Captain Moody, the officers sent down from the Home Office.

Mr. Jacomb, solicitor, Huddersfield, said—I was appointed Clerk to the Commissioners of the Holme reservoirs on March 3rd, 1846. The original clerks were Mr. Stephenson, afterwards, Messrs.

Floyd and Booth, and afterwards Mr. Martin Kidd. I produce the order book in which these appointments are entered. Mr. Stephenson was appointed on July 3rd, 1837, just after passing the Act. Mr. Floyd succeeded to the office upon the death of Mr. Stephenson, on December 30th, 1841. (Witness read the terms of the appointment.) On December 10th, 1845, Mr. Floyd tendered his resignation. On January 19th, 1846, Mr. Martin Kidd was appointed, and on March 3rd, 1846, I was appointed clerk; and I should like to explain how I became appointed clerk. Mr. John Brooke, of Armitage Bridge, and Mr. Joseph Brook, of Huddersfield, (two of the Commissioners,) with whom I was in communication on professional matters, not connected with the reservoirs, in the course of a conversation stated that they were in difficulty in respect to the Holme reservoir, for which they required my professional services, stating that Messrs. Floyd and Booth either had, or were

about to give up the clerkship, and they requested to know whether I would accept the appointment, I told them that I would consider the subject. I afterwards saw Mr. Floyd, to ascertain of him the circumstances which induced him to give up the clerkship, telling him that I would not accept the appointment unless with his full approbation. In reply he stated that the Commissioners were involved in much litigation and other difficulties, causing much difference of opinion among the Commissioners, and, as that several of them were connexions or clients of his, he found it difficult to act with pleasure to himself, and therefore he thought it would be better to give up the appointment; and that if I accepted the appointment it would be with his full approbation, and he saw no reason why I should not do it. In consequence, I afterwards told Messrs. John Brooke and Joseph Brook that I was prepared to accept the appointment. But——

The CORONER suggested that he did not see that this statement hardly affected the appointment.

Mr. Jacomb said—Only as showing the difficulties in which the Commissioners were then involved.

The evidence was consequently proceeded with:—For several weeks after that, I heard nothing of the subject, and concluded that Messrs. Floyd and Booth had obtained the appointment. I heard nothing more until I received a letter from Mr. Kidd, dated on or about March 3rd, 1846, stating that I was appointed. I afterwards received from Mr. Floyd all the books and papers connected with the reservoirs, for the purpose of enabling me to put all the powers of the act into execution. The date of the act is June 8th, 1837, and the first meeting of the Commissioners was on July 3rd, 1837. The meeting was held for the appointment of officers and the qualification of Commissioners. The names of the Commissioners who qualified at

that time are—John Brooke, Armitage Bridge; John Harpin, Burnlee; (since dead), Edward Butterworth; John Hinchliffe, Horsfield House; Thomas Cockin Wrigley; Joshua Moorhouse; John Hinchliffe, Scholes; James Horncastle; Geo. Battye; Joshua Littlewood; William Battye; Thomas Battye; George Parker; John Hobson; B. Butterworth (since dead); Joseph Beardsall (since dead); William Lockwood; Thomas Moorhouse, and John Hinchliffe, Upper House. Mr. Hugh Watt, was appointed treasurer; and Mr. William Stephenson, clerk. These are all the appointments made that day. (A notice was entered upon the Books which the witness read, ordering that the three reservoirs should be proceeded with, and that Mr. Jones should value the respective sites, and the land-owners should attend at the next meeting of the Commissioners to treat for the sale of their land. There is the appointment of a committee but not with respect to the Bilberry reservoir. I find

a meeting on October 20th, in which it is ordered that a committee, who were appointed to treat with land for the reservoirs, should call in valuers for the purpose of assisting them in valuing the land required. At a meeting of the Commissioners, August 2nd, 1837, the following Commissioners were appointed a committee to treat for land to be taken for the reservoirs:—John Brooke, John Harpin, John Littlewood, Edward Butterworth, and John Hinchliffe, of Scholes, with power for any three of them to act. The resolution of October 20th, has reference to this appointment at this meeting, it was ordered that Joseph Brook, Esq., of Huddersfield, be added to the committee. On the 6th of April, 1838, Messrs. John Brooke, Joseph Brook, John Harpin, John Littlewood, and John Hinchliffe, of Scholes, were appointed as a committee to engage a competent engineer for the making of the reservoir upon such terms as they think proper. At a meeting on the 26th

of October, 1838, it was ordered that the making, forming, and completing of the Bilberry mill reservoir, agreeably to the plans and specifications, be let to Messrs. Daniel Sharp, sen., and Daniel Sharp, jun., of Dewsbury, for £9,324. I am in possession of the original contract with Messrs. Sharp, which I now produce.

The CORONER.—Can I have a copy of that document?

The witness said it was an exceedingly long one, but it should be copied if it was thought necessary.

The CORONER.—Captain Moody says it is absolutely necessary that he should have it.

The Witness.—Then I will furnish him with a copy of that, and also another document which he may require, but the Commissioners are in such a state of absolute insolvency that I was desirous of saving them as much expense as possible.

Captain Moody said he must have copies of any documents which passed

between Mr. Leather and the Committee, and also between them and the contractors.

The witness said he was not aware that he had any such documents, having received the summons only on the previous afternoon, but he said the Commissioners had desired him to furnish every information, and search should be made for any documents, the nature of which the Captain would furnish him with.

Examination continued.—I find an order, under the date of February, 1840, which says that the salary of Mr. John Tait, the overlooker of the works, should be advanced £2, so that it is quite evident he had been employed before that time. Tait was paid by the Commissioners, and not by the engineer. I gather that Tait was overlooker of the Commissioners, and not of the contractor. Up to March 25th, 1840, I find no entry relative to the Bilberry reservoir, except payments in current to Messrs. Sharp, the contractors.

On the same day I find an order by the committee that the clerk write for Mr. Leather to send over a competent person to examine and measure the work at Bilberry reservoir, and the state of the works there, with as little delay as possible.

Captain Moody.—And to report?

Witness.—No, it does not say to report.

Examination resumed.—I find an order under date of January 4th, 1843, at a meeting of the committee that

“Whereas, Messrs. Daniel Sharp and Son, the contractors for making the Bilberry mill reservoir, having performed part of their work at the valve pit at the said reservoir, in an improper and unsatisfactory manner; it is hereby ordered that the clerks write to them to inform them, that unless they immediately alter the said work, and agree to complete the same to the satisfaction of Mr. Tait, the superintendent of the works, they shall cease to proceed therewith, and other workmen will be employed to complete the same at their expense.”

On the 12th of May, 1843, at a meeting of the Commissioners it was ordered—

“That the committee employed for general purposes be and are hereby empowered to take such steps, and enter into such contracts for the purpose of repairing the breach of the embankment of the Bilberry mill reservoir, and of making the same secure; and that any three of them be competent to act.”

At the same meeting it was ordered—

“That John Harpin, and John Brooke, Esqs., be appointed a committee to wait upon Mr. Leather to consult with him relative to the Bilberry mill reservoir, and the most effectual mode of repairing the breach in the embankment there.”

I find at a general meeting of the Commissioners, held on August 3rd, 1843, a committee was appointed to consider the tenders, and to let the work to such parties as they think proper. At a meeting of the committee, September 9th, 1843, it was ordered

“That the repairing of the embankment of the Bilberry mill reservoir, as advertised to be let on the 30th ult., be let to Messrs. David and George Porter at the prices contained in their tender, as specified in the schedule hereunder written, and that the contract be signed on Tuesday next.”

There is a meeting of the Commissioners on September 27th, 1843, at which Mr. Littlewood (who was one of the Commissioners) was ordered to measure and inspect the work contracted to be done by Messrs. Porter at the Bilberry mill reservoir, “and that he do give such orders and directions respecting the same

to the said Messrs. Porter or either of them as he may deem proper." I find an order under date December 20th, 1843, that Jonathan Thorp, of Holmfirth, mason, be appointed inspector or overlooker of the work at Bilberry mill reservoir at 5s. per day wages. On December 6th, 1844, there is an order by the Commissioners for the purchase of land from Messrs. Dyson for the site of a dwellinghouse for the drawer.

The CORONER said that was immaterial as the house was never built.

Witness.—On January 30th, 1844, there is an order that whereas an action at law had been commenced against the Commissioners by Messrs. Sharp for £3,405 10s. 4d. and interest thereon; Messrs. Floyd and Booth do defend the said action. The clerks were also ordered to apply to Mr. Leather for his report of the work done by Messrs Sharp. There is also the appointment of Mr. Jon. Woodcock, tailor, as drawer of the Bilberry mill reservoir.

The CORONER.—Are his duties defined?

Witness.—I do not see that they are.

The CORONER.—Do you find the appointment of a committee of management as is required by the 87th section of the Act.

Witness said there was no subsequent appointment to that committee he had already mentioned, which appeared to be annually re-appointed. I find nothing further connected with the Bilberry Mill reservoir until October 24th, 1845, when Messrs. John Brook, and Joseph Brooke, John Harpin, — Dyson, J. Littlewood, T. P. Crossland, C. Beardsall, George Hirst, C. Moorhouse, J. Moorhouse, J. H. Farrar, and John Hinchliffe, were appointed a committee to investigate into the whole circumstances relating to the reservoir, and that they report to the next general meeting of the Commissioners what, or if any further, powers are necessary, and that they do take such steps therein as they shall think proper, and that any five of them shall be empowered to act; and also that the next

general meeting of the Commissioners shall determine whether application shall be made to Parliament to alter and amend the present Act. At a meeting on November 5th, 1845, it was ordered that the committee order the clerk to write to Mr. Leather to prepare a plan and estimate for the repairing of Bilberry Mill reservoir. On December 10th, 1845, it was ordered that application be made to Parliament for further powers, and nine gentlemen were appointed as a committee to consider the necessary details. It appears there was a division upon that question; the numbers who voted for going to Parliament were 28, and against it 17.

The CORONER.—It does not appear that that application was intended for the repair of the reservoir.

Witness.—Oh, I beg your pardon; the application was for powers to borrow more money; and the previous resolution was for estimates for repair of the Bilberry Mill reservoir.

By a Juror.—Was it a repair of the embankment that was intended?

The CORONER suggested that the copy of the bill would show that; and the witness said he would produce a copy, and also copies of the notices of application to parliament. There is no other order I can find previous to my appointment, excepting for an application to Mr. Leather. On January 28th, 1846, it was ordered at a meeting of the committee, that inasmuch as Mr. Leather had not prepared an estimate, Mr. Joseph Hall, the late surveyor, and Mr. Joshua Littlewood, be requested to do so. At this committee meeting it was also ordered, that the Bilberry Mill reservoir be completed, and this completes the proceedings of the committee, up to the time of my appointment. The first managing committee under the 86th section of the Act was appointed on September 10th, 1840, "to manage and regulate the sluices and other works regulating the flow of water from the several reservoirs." There is a resolu-

tion renewing this committee every year, saving and excepting the last year; so that they appear to have been continued in office. Sometimes this committee have been re-elected, and sometimes other names have been substituted. The date of the last appointment is July 9th, 1850, when Messrs. John Roebuck, James Robinson, John Haigh, George Hirst, Edward Butterworth, Joshua Moorhouse, John Hinchcliffe, (Scholes), David Hinchcliffe, Sidney Morehouse, Able Cuttle, John Moorhouse (Tenter Hill), and Joseph Broadbent were appointed the committee. There are no other duties assigned to this committee, except the regulation of the sluices, and the regulation of the supply of water mentioned in the 86th section of the Act. I understand there has always been an arrangement between the committee that three of the committee (I think that is the proportion) or some number of them residing nearest to each reservoir, should take the management of such reservoir, and that the remainder of the

committee should be a sort of general committee.

The CORONER.—Do you understand anything by the word “management,” beyond the supply of water and regulation of the sluices mentioned in the 86th section.

Witness.—I understand that it refers merely to the regulation of the supply of water, and the Commissioners had the drawer under their direction, but they had nothing to do with the reservoir or the general construction of the works. Under the 86th section of the Act, a drawer was appointed for each reservoir, and who resided near each reservoir. Charles Battye was the drawer of the Bilberry mill reservoir, and his salary was £5 per annum. Application had been made to Parliament when I was appointed clerk; at that time the Commissioners—as Commissioners, were insolvent, and have remained so ever since. By the Holme Reservoir Act of Parliament, they were authorised to make four pairs or eight reservoirs, and to borrow £40,000 at 5

per cent interest for that purpose. I found they had borrowed the whole of the £40,000, and not only expended the same in the construction of the three reservoirs which they had then made, but also they were indebted, or had claims against them, to the amount of several thousand pounds. Amongst other debts there was one of £2,000 to the Huddersfield Banking Company for money which I understood they had borrowed of that bank, and expended in bare repairs of the Bilberry mill reservoir. There was also some money claimed by Messrs. Floyd and Booth, by Mr. Leather, by Messrs. Porter, and Messrs. Sharp.

By a Juror.—Do you know the sums?

Witness.—The claim put in by Messrs. Sharp was upwards of £3,000, but which could not be paid until Mr. Leather had certified that the work was properly done. Mr. Leather refused to certify that the work was correct, or had been properly done; and Messrs. Sharp filed a bill against the Commissioners in Chancery;

and an action at law was pending when I was appointed clerk. The Commissioners were also involved in some litigation with the rate-payers, who had refused to pay their rates. The Commissioners had levied distresses upon them, and the rate-payers had brought actions of replevin, which had been taken down to York for trial, and an order of reference had been made to the late Frederick Robinson, Esq., barrister-at-law, which reference was pending when I became the clerk. Mr. Kidd had prepared a bill and deposited it in Parliament: the object of which was to repeal the existing act, and grant a new one to alter the mode of rating, and to authorise the borrowing of a further sum of money; to repair and make perfect the existing reservoirs, and to pay off the floating debts of the Commissioners over and above the £40,000 which they had authorised to borrow by the existing act. I took it as it was proceeding upon the standing orders. It passed the standing orders committee. This was in the great

parliamentary session of 1846. We did not get into a committee of merits until the month of June. A proposition was made to get rid of the opposition, which was that the great and important question of the rating should be left to scientific men to decide. The acting Commissioners who were the promoters of the bill (if I may be allowed the expression) were to name one person, and the opponents another, and these two gentlemen were to appoint a third, and these three gentlemen were to lay down a mode or principle of rating. By the existing act, there were some clauses setting out that the mode of rating was to be by the feet of "fall;" but other clauses were inserted which overrode those clauses, (and which were called the beneficial clauses,) and which, according to the construction given in Mr. Frederick Robinson's award, made by the mode of rating to be by the horse power. It was to be left to the three scientific men to say whether or not they could lay out a mode of rating which

would do justice to all parties. The opposers of the bill proposed Mr. George Crowther, as their engineer. I, on the part of the promoters, both went and sent to all the neighbouring towns, and every place where I thought I could get some competent engineer who would undertake the reference on behalf of the Commissioners; but after adjourning the meetings from time to time, at last we could get no person to undertake it, such was the pressure of the demand for that kind of talent at the time. We were, therefore, obliged to go to parliament. (The witness read an extract of an order made at a meeting of the Commissioners, on the 22nd of June, 1846, embodying this statement and ordering the bill to be proceeded with forthwith). Upon appearing before the Commissioners an objection was taken as to the form of the bill; inasmuch as it was a bill to repeal the existing act, and not a bill to amend and for further powers; and the committee held the objection to be valid,

inasmuch as by repealing the act they might interfere with vested rights.

The CORONER.—Then the bill was lost.

The Witness.—I am sorry to appear tedious, but you will see the force of the statement I have further to give. The committee held the objection valid, but stated that they were willing to grant us a bill for the purpose of raising a further sum of money for the repair and completion of the reservoir, and for the other purposes contemplated by the bill, and they gave us time to consider whether we would bring in such a bill. The promoters of the bill and myself then communicated with the opponents; and I also made inquiries of different parties in parliament whether there was a probability in the then pressure of public business, if we brought in such a bill, that we could carry it that session. The result of that enquiry was, that it was not. We then renewed our negotiations with our opponents, which ended in an arrangement between myself and their solicitor, which

arrangement is contained in two letters dated June 29th, 1846, and was, that both should agree to apply for such an Act in the succeeding session as would do justice to both parties. Previous to that session I prepared, and gave notice of depositing a bill for the purpose of raising a sum of money, and for similar purposes to the former one. After depositing such bill, at a meeting of the Commissioners held December 29th, 1846, (at which both the letters alluded to were read), a resolution was come to that it was inexpedient to proceed with such bill. In January 1847, an extraordinary meeting was held, at which it was resolved that no further proceedings should be taken, and of course none were taken. Between these applications to Parliament Mr. Robinson made his award (dated November 26th), and by which he decided, that the mode or principal of rating hitherto made by the Commissioners had not been the legal one,—that it should have been per horse power, and not according to the

foot of fall. Subsequent to that first award, some of the ratepayers gave in notice of appeal under sec. 71st, and another reference was made to Mr. Bateman on behalf of the ratepayers, and Mr. F. R. Jones for the Commissioners; but as they could not agree upon their award, Mr. F. Robinson was called in as umpire. His award was that the rating should not be according to the horse power, but according to the schedules he appended, setting out the amount of rates to be paid per horse power; but according to his award a sum of only some £700 or £800 could be raised, instead of £1,800 as usual. Previous to the session of 1849, the mortgagees gave notice of an application to Parliament for a bill. A meeting of the Commissioners was held February 9th, 1849, and it was ordered that a petition on behalf of the Commissioners be lodged against the bill, in order that the Commissioners might be in a position to protect their interest before Parliament. No further proceedings were to be taken without

the consent of another meeting, and a committee was appointed for the purpose of making arrangements with the mortgagees, if possible. This bill was supported by a portion of the Commissioners, and opposed by other Commissioners, on account of the proposed increase of rates. The bill passed through the Commons, but was thrown out in the Lords. In the bill before the Commissioners a clause was inserted for the repair and completion of the Bilberry reservoir. During the time I was clerk I always understood, from what was stated at several of the meetings, that the Bilberry reservoir was safe up to a certain height; but I never saw the reservoir until the other day. At a meeting of the Commissioners on August 16th, 1846, the following order was made—

“That an opening be made in the waste-pit of the Bilberry reservoir, at the height of 18ft. above the clow or shuttle, and that Mr. Littlewood be requested to see that the same be forthwith carried into effect.”

I never knew to the contrary, until this accident, but that this had been done.

By the CORONER.—Can you say that after that, it was thought necessary to do anything at the reservoir?—It was thought necessary to do something, because we applied for powers to borrow more money for the purpose of repairing that reservoir; it was thought that it would become dangerous if the water was allowed to accumulate. As I understood, in consequence of our not obtaining that Act of Parliament, it was considered advisable to let this prudent measure be recorded on our books.

Were you then aware that the waste-weir was higher than the embankment?—I was not.

Do you find any other order in reference to this waste-pit?—I am not aware of any other. When we went to Parliament in 1846, part of our estimates deposited included the completion of the Bilberry Mill Reservoir; when we went to aid and assist the mortgagees' bill, we were also prepared with evidence that it would require a sum of money to complete this reservoir. I understood the object of the

completion of the reservoir, though we had the power of making eight reservoirs, this alone, if it were made a perfect reservoir, to hold all the water that it was capable of containing, would supply the mills quite as well as the eight.

That was the object of the intended repair?—Yes, it was to make the reservoir capable of containing equal to its capacity. Not that in itself it was dangerous, but that it would become so if the waters accumulated in it.

The inquest was adjourned while the jury partook of refreshments. On their re-assembling,

Mr. George Leather, C. E., was sworn, and said—I had nothing to do with the application to Parliament for the Holme Reservoir Act. I have a plan showing who were then employed. I received a letter dated June 18th, 1838, signed “H. and S. Stephenson,” enquiring whether I would undertake the management of making the Holme reservoir. The letter was read. It stated—

"The Commissioners will employ a surveyor under you, viz, Mr. John Crowther, or some other gentleman, to attend to the works, so that you will only have to give directions, and therefore will only be required to come over now and then, as circumstances might require."

(Mr. Leather stated that Mr. George Crowther was meant in this letter.) On the 23rd I wrote, stating my terms and accepting the appointment, and recommending the Commissioners to have plans and specifications prepared, and the work properly laid out, and then to employ practical men to be constantly on the spot. In pursuance of that appointment, I prepared plans and specifications, and amongst others for the Bilberry Mill reservoir, which I forwarded to Messrs. Stephenson, on October 3rd, 1838. The letting took place at the latter end of October, but I was laid up of a lame leg at the time, and was unable to attend. I have original copies of those plans and specifications, which I produce. (Mr. Jacomb produced the specifications which had come into his possession.) This is the specification for the whole of the

reservoirs, with Sharp and Son's estimate; and this is one of the plans (No. 3), but No. 1 would be for the Bilberry reservoir. I can produce you my originals. I produce a plan of the ground of Bilberry reservoir, prepared by Mr. G. Crowther, No. 3 A., which is a series of sections, two across the valley, and six of the embankment, showing the puddle and the embankment. I produce my original copy of the specification, and my original to No. 3 B.

By Captain Moody.—I will ask you a few questions as to what were your *data* for the area of the drainage. What was your calculated area of the drainage to this reservoir?—1,400 acres; the data were furnished to me in a letter from Mr. George Crowther.

What were your *data* as to the fall of rain on the said area?—I had no data for that, but in making my provisions for a case of this sort, I generally suppose that two inches of rain shall fall and pass off in 24 hours. That might happen,

but it would be a rare case ; but I assume that fall in 24 hours in providing for the necessary outfall. Then two inches of rain on 1,400 acres would produce 10,164,000 cubic feet. This would pass off over a waste-weir of 36 feet, if it had a depth of 16½ inches ; and the area of the culvert at the bottom of the waste-pit at the Bilberry reservoir, would have to take that away, and it would require a velocity of very little more than three feet per second, to pass off the same quantity, being more than two inches an hour.

I notice a difference in the dimensions of the culvert on this plan (the copy produced by Mr. Jacomb) and on your original?—I put this (pointing to the original) in, as my original plan.

You have stated the dimensions of the culvert as you conceive it to have been. Perhaps you know enough to explain the description of the rock and subsoil at the bottom and sides of the reservoir?—There is a table of bearings which will explain

that to you ; it was furnished by Mr. Crowther. (Mr. Jacomb promised to look for it.)

Perhaps you will describe, generally, the dip?—It is shale and rock.

Have you any idea of the direction or bearings of the dip?—It ran across the valley. The rock about the reservoir consists of millstone girt and shale alternating.

And the direction of the dip?—It is across the valley.

At an angle of what?—Not a very great angle. It rather lays flat.

Are you aware at all what dip it is?—No, I really can't tell.

Is it gentle?—Rather gentle, I think.

By the CORONER—Can you at all state whether your specifications and plans were carried out, or whether the work varied in any way?—All that I can say is this, that I received repeated statements from the overlookers that they could not get the contractors to carry it out according to the specifications ; and I always

insisted upon their doing so as much as possible.

Then of your own knowledge you are unable to state anything?—Of my own knowledge I am.

By Captain Moody.—These, you know, are the important points?—Well, I will endeavour to answer any questions which you may put.

I notice in the specifications that it is required that “the puddle trenches shall be cut their full width down to the rock, and that they must be footed five feet into the rock, in the manner shewn in the cross-sections,”—do you know whether that was done?—It was reported to me as done.

You did not see it?—I did not see it, of course.

By Mr. Martin.—Was Tait appointed by you? No, he was appointed by the Commissioners. They applied to me to recommend a man, and I sent him to them.

By Captain Moody.—Tait will be able to state what was done?—Not the whole

time, a man named Cheeseman was also there.

By Mr. Martin.—Were they appointed by you, or by your direction?—I recommended them as two practical men.

By the CORONER.—Did you recommend both Tait and Cheeseman as overlookers of this work?—Yes, and they were appointed by the Commissioners.

By Captain Moody.—Did you see the bottom of the puddle-trench before they commenced puddling?—No, I believe I did not.

Could you state the mode in which the puddle was filled in?—When I saw it, it was well mixed, and lain-in in layers.

According to the specifications?—Yes; the puddle was a mixture of clay and gravel; a small quantity of water was left on the top, and it was well worked with spades.

By the CORONER.—As far as you know, the puddling was done according to the specifications?—Yes, as far as I know.

You occasionally examined it?—Yes;

whenever I saw the puddling, it was done according to the specifications.

By the FOREMAN.—Was the breadth of the puddle when you saw it according to the specifications?—I think it was.

But are you sure it was?—I am sure that it was 16 feet at the bottom, and it gradually decreased to 8 feet at the top.

By Captain Moody.—Was any report made to you of any springs or drippings from the rock at the bottom of this trench before they commenced to puddle it?—No, no such thing.

You were not aware of any such report?—Never. No report was made to me of any such thing. I know of no such thing.

By the CORONER.—Was it part of your duty to examine whether there were any such spring?—If there had been anything of the sort reported to me, I should necessarily have come over, because it is very important to take all springs out of the bottom of the puddling.

If you had any knowledge of such

a spring you would have diverted it, I suppose?—Yes.

By the FOREMAN.—During the process of forming the embankment, did you never hear anything of a spring at the bottom of the embankment?—At the outside of the embankment there was a spring.

None at the bottom of the embankment?—No.

By the CORONER.—You did hear of a spring at the outside of the embankment?—There was a spring below the embankment. That was after the water had risen a little in the reservoir. It was coming out of the rock, I have no doubt.

By Captain Moody.—Coming under the embankment?—Yes; the spring was on the right-hand side of the wall as you go up.

By a Juryman.—And a very strong one too?—Yes; but it was not under the embankment.

By Captain Moody.—It got clear of the embankment?—Yes, quite clear; and it ran clean water.

Will you be good enough to describe how the original brook lay during the progress of the work?—It was passed into the old channel to Bilberry Mill by troughs and a puddle. It is specified here (pointing to the specifications), and was done according to that specification, so as to give Bilberry Mill the advantage of the water.

Was there any failure in that?—Yes, on one occasion there was a flood came down, and it destroyed the troughs, washed them away, and also took a piece of the embankment away; but it was not then very high.

Did any of that water fall into the side of the puddle or dam?—It washed part of the puddle away, which was replaced.

Did you see that it was replaced?—I gave directions. I could not see it done, for it would take weeks to do it; but I gave instructions that in putting in the puddle they should perfectly unite it, by chipping part of the old wall and puddling it together.

By the CORONER.—Did you consider yourself the engineer from the commencement to the completion of the work?—Why, not to the completion, for it never was completed in fact.

The FOREMAN.—A very just remark!

By the CORONER.—Then you considered yourself engineer from the time of the commencement of the works up to what period?—The last time I was there I will tell you. (After referring to some papers.) I was there four times in 1844, and the last was in September that year.

That was the last time that you visited the reservoir?—It was.

What was the reason of you discontinuing?—In July 1844, when they were going on with the repairs of the reservoirs.

But I have had no description of these repairs?—At that time I was perfectly satisfied that the reservoir could not be made to hold water without a puddle line. I described that to some of the Commissioners who were present, and how it ought to be done, in which they seemed

to acquiesce, and I gave orders to the overlooker to have the water got out of the bottom for the purpose.

By Captain Moody.—You are speaking of a failure in the dam?—I am speaking of my conviction that what was going on could not make it good ; in answer to the Coroner's enquiry why I ceased going. When I went in September I found nothing had been done ; and the overlooker told me that my orders had been countermanded. (Sensation.)

By the CORONER.—Who was the overlooker?—Jonathan Thorp.

By Mr. Martin.—Did he tell you who countermanded the order?—Mr. Littlewood ; and I did not go afterwards.

And you considered that you had no connexion with it?—I did. I think I did go over on the following September.

By the CORONER.—What was the nature of the defect?—I had a written specification for it to try to make the bank good.

In what respect had the bank failed?—

There was no doubt that there was a run through the puddling at that time.

That was in July, 1844?—No, that was in 1843. I wrote specifications in August, 1843, for a portion of the embankment to be taken out and replaced, and the culvert to be re-built.

Can you describe what the failure was for which you had gone over in July, 1844?—In July they were progressing with this work, but from the appearances of very muddy water coming out, I was quite sure it could not be cured without a puddle line.

[Some little confusion having arisen as to the dates, an explanation which we need not further notice, was here made.]

By the CORONER.—What was your reason for drawing up the specification of August, 1843?—We had previous to that gone down with a pit in the embankment and found it unsound, particularly adjoining the culvert. A part which ought to have been solid masonry in the middle of the puddling was only rubble.

Having found that defect, I then concluded that it might be the sole cause of the leakage, and I wrote these specifications of August 1843, to remedy it.

Were those specifications complied with, and was that work carried out?—It never was finished so long as I had to do with it; but I think it was, under the superintendence of Mr. Littlewood, afterwards.

And the work was never done during the time you had to do with it?—I was never called to pass the work at all. During its progress I received frequent communications from Jon. Thorp complaining of the masons not doing it according to the specifications.

By Captain Moody.—In September, 1844, to what height had the work progressed?—I cannot answer you that question, I'm sure.

To go back to where we had parted from; I want to ask you, did you appoint the overlookers, and did you consider yourself responsible to the Commissioners for

their performance of their work?—Certainly not. I did not appoint them; and the Commissioners could discharge them at any time. I only recommended them to the Commissioners.

Are you aware that any differences occurred between the overlookers and contractors from time to time, but particularly at the commencement of the puddling and with reference to the puddling?—There were frequent differences betwixt the overlookers and the contractors almost from the commencement.

Were they reported to you?—Yes, and I insisted upon their seeing the specifications complied with.

This was from their not complying with the specifications?—Yes.

By the CORONER.—Did you report these to the Commissioners?—They were reported to the Commissioners by the overlookers constantly.

By Captain Moody.—Do you know whether the differences betwixt Messrs.

Sharp and the Commissioners were anything in connexion with the puddling; or what those differences were, were they engineering difficulties, or pecuniary ones?—They were both, but more pecuniary, with regard to the Commissioners.

How high had the embankment got up when this first fault was discovered?—It was approaching fast towards the top, but I can't charge my memory how high; it was a good way up.

Was there any head of water in the reservoir?—There had been a head of water, which had taken part of the puddle away at the foot; I conceived that because it ran muddy.

What date was that first failure?—I think it would be in 1842, the latter end of 1842, but I can't exactly charge my memory with it now, it is so long since.

Captain Moody.—Oh, that will do.

By the CORONER.—Have you any memorandum of your journies to the reservoir?—I have nothing except the letters of the overlookers.

The first defect found out was in 1842, and not in 1843?—It was at the latter end of 1842 or early in 1843, I am not quite sure which.

There was a head of water in then?—Yes, there was; but it was run off soon after and there was a settling in the puddle. It came through the culvert more particularly, but it came muddy, showing that the water was acting upon the puddle, and therefore no doubt must have taken away the puddle at the bottom of the embankment.

At the bottom of the embankment you say?—Yes, at the bottom of the embankment.

What steps were taken to remedy that?—It was stated by some of the men that part of the masonry of the culvert was bad, and instead of being solid masonry was only erected with rubble. We sunk down and found it so; then we sunk a pit down the puddle outside.

By Captain Moody.—At the back and top of the culvert?—Yes.

By the CORONER.—Was that defect remedied?—Yes, we sunk a pit down through the puddle and put it right, but that did not remedy the leakage.

You replaced the masonry belonging to the culvert?—Yes.

By the FOREMAN.—Was the masonry belonging the culvert done according to the specifications?—No, it was not.

What depth of solid masonry was there to be?—I think 8 feet, but it is specified here (pointing to the specifications).

(The evidence as to the discovery of the leakage and this first ineffectual remedy was then read over, and the witness added —“That was done by Sharps’.”)

By the CORONER.—What was the next defect for which you drew up the specifications in August, 1843?—It was the same defect, as we had not remedied it; the specifications were to take out a piece of the embankment and replace it, and to rebuild the culvert.

And the work so far as you know was never done, that is, you don't know that

it was done?—I don't know. I was never called on to settle the work nor to look at it.

The next defect was in 1844?—No, it was still the same defect.

The defect you mentioned in July, 1844, was it the same you specified for in August, 1843, and noticed at the end of 1842, or beginning of 1843?—Yes.

By Captain Moody.—Do you know who took the contract under these specifications?—I dont; some persons took it, but who they were, or how they took it, I don't know.

The CORONER read part of the specifications as to the construction of the culvert, and asked—Can you from your own examination, otherwise than from the reports of the overlookers state that either this or any part of these specifications was executed according as you would have had them done?—Not to my own knowledge. I did not see it, I could not see because I was not there. I only went very occasionally.

By the FOREMAN.—How was it that the

part which should have been solid masonry was allowed to be proceeded with in rubble?—It was reported to me as done in solid masonry.

By the CORONER.—In point of fact, it was no part of your contract with the Commissioners to see your specifications and plans carried out;—I could not possibly see them carried out. No, it was rather the contrary. My engagement was to write the specifications, and there were to be practical men upon the spot to see them carried out. I made the plans and specifications to the best of my ability, and believe they were as good as I ever saw any reservoirs made. The letter of Messrs. Stephenson specifies that some other gentleman would attend the works, and I should only have occasionally to attend.

By Captain Moody (pointing to the plans). I believe there is no grating or bars in front of the shuttle?—I am not aware there is not. They are generally put-to the last thing.

By the CORONER.—What was the height of the embankment when these works were completed, and what was the height of the waste pit?—59 feet was the waste-pit, and the top of the embankment 8 feet above that, that is according to this plan.

What was the opening or size of the shuttle?—18 inches diameter.

What do you call that?—The supply valve.

And the size of the culvert?—6 feet 6 inches broad, by 6 feet 6 inches high. The superficial area is 37 feet and $\frac{3}{4}$ ths, say $\frac{1}{2}$.

What is the proportion between the water coming from the shuttle compared with that which it will allow in the culvert?—Very small indeed, but you will naturally see that that depends upon the head of pressure.

In any event it will be very small?—Yes; compared with what should come through the culvert by means of the waste-pit. One rule is—5 times the square root of the head gives the velocity; and that

would want correcting. The flow of water through the supply valve would be larger when the reservoir was higher.

By the FOREMAN.—Supposing the water was four feet from the top of the coping, would the shuttle be capable of discharging the quantity of water which came in on the 4th of February?—Certainly not. The valve was not calculated to discharge flood waters at all; that was not its object.

But the pit could not discharge them when the mouth was above the top of the embankment?—That is quite clear; but if it had been 8 feet below the top of the embankment?

By the CORONER.—Suppose the shaft of the waste-pit had been in proper order, in case of flood was it sufficient to have taken away the water?—Oh dear, no doubt about it; the waste-pit would. If it had run over at 16 inches deep it would have discharged 10,164,000 cubic feet in 24 hours. That quantity would have been equal to a rain-fall of two inches perpendicular upon 1,400 acres

of land—a very large and almost unprecedented thing, but I always think it necessary to provide such an outlet.

In your judgment, if the specifications made out here had been properly executed, were they sufficient for the security of a reservoir of this size?—The embankment was sufficient for any sized reservoir. The internal slope was 3 to 1, and the external slope 2 to 1, which would give a base of five feet for every foot vertical, besides the width of the top, which was sixteen feet, I think.

How do you account for the subsiding of the embankment subsequently to its being formed?—It was from the leakage which evidently affected the puddling, and took part of the puddling away; there is no doubt about it. The water ran muddy, and that showed that it took part of the puddling.

Was that the leakage you noticed in the beginning of 1843, and specified for in August, 1843?—Yes, and what was attempted to be remedied.

And you had noticed the subsiding of the embankment at that time?—I am not certain whether it was the latter end of 1842 or the beginning of 1843.

Whichever it was, had you noticed the subsiding of the embankment at that time?—Yes, it very soon made its appearance at the top.

And you made out some specifications as to the supposed cost of repair, the amount of which was £7,800?—No.

You made a subsequent specification to this dated August, 1843, for remedying the defect?—Yes; it was an estimate when they were about to go to Parliament.

Can you refer to the date of that estimate?—Yes, that was on the 2nd of February 1846. I made an estimate for going to Parliament.

You made it for the Commissioners?—Yes, and I sent it to Mr. Kidd. The amount is £7,800.

For repairing and rebuilding the embankment?—No, it was for lining the

embankment with puddle to make it water tight.

Were you to raise it up to its height at that time?—I did not see it at that time and therefore don't know what height it was then. I did not come over ; but having the plans of the reservoir I measured the space that I had to puddle, and made an estimate of that, as well as another for securing the sides, which amounted to £7,800, and that was for the purpose of going to Parliament.

By Mr. Jacomb.—Was that solely for the lining of the Bilberry reservoir?—It was. I produce the original estimate.

The CORONER read the letter accompanying it which (omitting the formal introduction and conclusion) is as follows :—

“After a very careful consideration of the subject of the Bilberry reservoir, and the difficulties there are to contend with in making it water-tight, in consequence of the rocky sides and bottom, I am of opinion that the only efficient mode which can now be adopted will be to take down the swallow-walls from the waste pit into the reservoir and in lieu thereof to build a substantial Ashlar culvert for conveying the water to the supply pipe—to clear away the earth forming the embankment to a sufficient

extent, to unite a puddle with the puddle round the waste-pit and the puddle wall which must be brought out to the foot of the embankment,—to take up the present pitching of the inner face of the embankment and the earth beneath it to the depth of 6 feet, when a puddle of 3 feet thick should be laid on over the whole face and covered up to the present level and re-pitched—to clear out the bed of the reservoir as far as any cracks or open strata appear, and to cover it with good puddle 3 feet in thickness—to examine carefully all the fissures and crevices in the rock or shale in the sides of the reservoir as the water rises, and to make them good with puddle walls where they can be applied, and in other places where the sides are too steep for puddle walls, by masonry set in cement or the Welsh mountain lime, such as is now used at the Liverpool Docks. The expense of doing this work and making the embankment perfect again will, of course be heavy, and is difficult to calculate. After the fullest consideration I can give it, I estimate the cost at £7,800, and for that sum I feel no doubt the reservoir may be made perfect and water-tight.”

Mr. Jacomb.—There is more than the puddling stated there.

The CORONER then read the estimates over, and asked—

That sum of £7,800 you would have required to have made the reservoir water-tight?—Yes.

Without this work being done, do you think this reservoir has ever been in a

safe or secure state?—Why, not having seen it for a long period, I can't tell; but if it has settled so much, I don't know that it has, it would not be safe to be below the top of the waste-pit. I should have felt very great fears about it, because when it ran over, it must take away the outer slope. It was formed of the debris of the valley only, but I gave them instructions to mix the great and small together as much as possible.

And as is usual in works of this kind?—Yes; the puddling is the great thing to depend upon. The embankment is merely to add weight; but when the outer slope was washed away, then the puddle would be left unsupported.

It appears in evidence before the jury that, on February 4th, the water ran several hours over the embankment; looking at your own estimate, and if this statement be true, to what do you attribute the bursting of the embankment?—Not being there I——

I am merely asking your opinion?—

My opinion is that it is rather astonishing it has stood so long as it has, considering there was a leak through it. (Great sensation.)

Now give me your opinion of the cause of the bursting?—My opinion is that when the water began to run over it washed away the outer slope, thereby taking away the support of the puddle, which would already be weakened by its subsiding; and then, inasmuch as there would very likely be a space or crack between the inner bank and the puddle, the water getting in would cause it to give way all at once when it was relieved from support on the outer bank. If the waste-pit had been seven or eight feet below the inner embankment, the inference is that the embankment would have stood. If the orders of the Commissioners had been carried into effect, for the making of a hole of a proper size in the waste-pit above the shuttle, it might have prevented the accident. If I had been consulted I should have re-

commended the lowering of the waste-pit to the depth of seven or eight feet below the top of the embankment. No great expense would have been incurred in this, and the stones might have been kept for further use. This might have been done at the expense of 3d. per cubic foot. A very small sum would have sufficed for this, and it would have been easily done.

The CORONER.—Can you say how much would have sufficed; for it is important that it should be known how small a sum would have sufficed to have prevented this terrible accident. Would £20 have sufficed?

Mr. Leather.—I should say that £12 10s. would have been the expense of lowering the waste-pit some 7 or 8 feet below the embankment (sensation). I infer that this accident might have been prevented from the fact of the embankment having stood some time after the water began to overflow it. I have heard since the present inquiry that the water over-

flowed it. (The following witnesses were called upon this point.)

Charles Battye, the drawer, said—At 9 o'clock the water did not flow over the embankment. It began about 11 o'clock. The embankment gave way about 12 o'clock).

Joseph Whiteley Broadhead said—The water got into the cavity at the top of the embankment about half-past 11 o'clock. The depth of this cavity was one yard and a-half. I should say it was about a quarter to 1 o'clock when the embankment gave way.

Mr. Leather.—My original engagement was not to superintend the works, and after I gave up the work in September, 1844, I was never again applied to.

By Mr. Jacomb.—The last time I was at the reservoir was in September, 1845. I then saw the embankment, and saw there was a settlement at the top; but whether more than one I cannot say. I cannot form any opinion as to the depth

of that settlement ; my object was to ascertain if the leakage was stopped, and with a view of making an estimate for you to go to Parliament. I did not notice whether the top of the waste-pit was higher than the embankment. I did not suggest to the Commissioners the lowering of the waste-pit. It was out of my hands altogether. I ceased to be employed to pass the work in September, 1844. In July I recommended certain things which I found were countermanded by Mr. Littlewood, and I never went again, nor was I called upon by the Commissioners to pass the work. It was during the time when the Messrs. Sharp were performing their contract that the first defects were observed. Jonathan Thorp was only employed while a portion of the embankment was taken out. By the contract I made, I was to certify that the work was properly executed before payment was made. I never did certify, and I refused to do so, because the work was not properly executed. When I made the specification of

August, 1843, it included the cutting down of part of the embankment, and the building of the culvert. There was a cutting made in the embankment. I came over to see it. The contractors employed to do this work were persons of the name of Porter. I was over in 1844; and Messrs. Porter were proceeding with the work at that time. When I was over in September, 1845, I think the work was complete; but I really don't know, for it was not under my direction. I cannot charge my memory upon this point. I was sent to make an estimate for Parliament, and it was no part of my duty to see whether the hole was made up or not. During the two or three weeks preceding the 1st of February, a considerable quantity of rain has fallen, and we have had a very wet time. Whether it continued up to the morning of the accident in the neighbourhood I cannot tell, for I was in London at the time. I know that there have been very heavy floods during that time, and according to reports they have

had great difficulty in other places in preventing accidents. There are places where water has never been so high before—Manchester for instance, where I hear the water was higher than during the flood of 1828. In my judgment and belief, I infer that this embankment having stood till it was overflowed, it is a fair inference that it would have stood if the water had not gone over it. (The other witnesses were ordered out of court during this part of the enquiry.)

By the CORONER.—Never since 1841 have I received one penny from the Commissioners on account of these reservoirs. There is an account yet owing for my coming over in 1844, and for making out my estimates in 1845, and February, 1846. I came four times in 1844 to examine the works, and considered I had done with the works, inasmuch as they were transferred to other hands. When I came over in 1845, it was entirely upon a fresh retainer.

After a lengthened examination of witnesses, which lasted two more days, the

CORONER then proceeded to sum up the evidence at great length, but, owing to the indistinctness with which he was heard, we can only give a brief epitome of his charge to the jury. He said it was not his intention to occupy much of their time in going through the great mass of evidence which had been taken upon the present enquiry. It was at once evident that, previous to the 4th of February, the embankment of the Bilberry Mill reservoir had been in a very imperfect and defective state; but he was of opinion that there had been no criminal responsibility incurred by the Commissioners. A great amount of evidence had been given which he would save them the trouble of reading over. The real origin of the disaster seems to have been the fact of the wash-pit being suffered to be higher than the embankment. The Commissioners in 1849 reported that the reservoir required repairs, and there was ample time for lowering the wash-pit. The liabilities under which the Commis-

sioners were placed had nothing to do with the question and ought not to enter into the inquiry. The jury would observe from the wording of the Act of Parliament, that the Commissioners were made into a body politic—in fact, became a corporation with a common seal. The Act was passed in 1837, and in June, 1838, Mr. Leather was employed as engineer, but as he was not so engaged as to be criminally liable under that Act of Parliament, it was not worth while troubling the jury with the evidence upon that point, excepting to add the remark that if Mr. Leather's plans and specifications had been fully acted upon, the reservoir would have been safe. John Tait was employed as overlooker; and it appeared that from the very first, complaints were made as to the mode in which the contract was performed. In 1839 a spring was discovered which perhaps was the remote cause of the present calamity, but as the immediate cause of it was the waste-pit being lower than the embank-

ment, the Commissioners could not be personally responsible. The next point was to consider what efforts were made by the Commissioners to remedy this state of things. He was not aware that the pecuniary liabilities of the Commissioners ought to have any weight with the jury in the consideration of their verdict. It appears that in 1846, an order was made that an opening should be made in the waste-pit, and that Mr. Littlewood took the necessary steps for doing so, but from some threatening interference he desisted from making the required opening. Mr. Littlewood not only took no further steps in the matter but never reported to the Commissioners, or did what he ought to have done, viz., call a special meeting of the Commissioners for the purpose. He would not say, if the Commissioners had been liable that this would not be a criminal act on the part of Mr. Littlewood; but he could not be fixed with liability. No doubt he ought to have called a meeting of the Commis-

sioners, and possibly they might have taken such steps as would have prevented the misfortune which has happened. Mr. Littlewood was highly censurable for not making an opening in the waste-pit or immediately reporting it to the Commissioners. He would now come to February 4th. There had been very heavy rains, as they were all aware, on that day; so much so that Battye, one of the witnesses, found that the water had risen 40 feet in the reservoir, and that something had been fastened against the shuttle. But it would seem that if such had not been the case, and the shuttle raised to its utmost limits, it would not have been large enough to admit all the water through it which came into the reservoir. It appeared that Charles Battye and others were upon the embankment during the evening; and he proposed to read over to them the evidence of Whiteley, because it appeared to him to be the most connected account of what had transpired, and because it referred to some matters which he wished to mention

to them. (The Coroner then read over the evidence of this witness.) They would observe that he had described the bursting of the reservoir almost in the very words Captain Moody had made use of in his statement as to how he supposed the embankment would give way. From Whiteley's evidence it appeared there were several expressions made by John Roebuck relating to the danger of bursting. These expressions were first used about 5 o'clock in the afternoon. At that time it was too late to alter the waste-pit so as to have taken the water away. It was certainly very extraordinary that these parties should have remained upon the embankment without giving early warning to those living in the valley; and that no person should have given any warning at all until it was too late. It was incumbent upon all of them to have given warning when they saw the danger; and not more incumbent upon John Roebuck than the rest of the party who were there. The em-

bankment burst about one o'clock, and the immediate cause of the catastrophe had been described by Captain Moody. (The Coroner quoted largely from the statement made by Captain Moody.) As he had said before, the jury must discharge the engineer, contractors, and overlookers from all responsibility. The next point to consider was as to the criminal liability of any one else. It was evident that the Commissioners had been guilty of very gross and culpable neglect, and nothing which he had seen would at all justify them in what they had done. Most certainly if they could have been fixed with responsibility, they would have been indicted for manslaughter; but from an opinion of high authority he held in his hand, and which he should hand over to the Foreman when they retired to consider their verdict, it would be seen that by reason of their being a corporation they could not be made personally responsible. He could not however say that in his mind the Com-

missioners had done what they ought to have done. It appeared to him that when they failed in their application to Parliament, they ought to have taken the water out of the reservoir altogether. There might be penalties laid down in the Act to which they would perhaps be liable, by not giving a sufficient supply of water to the mills down the valley ; but when it was seen that the sum of £7,800, according to the estimates put in, would be required to repair the reservoir, and that the Commissioners had failed in their application to Parliament, he felt satisfied that supposing the Commissioners, by emptying the reservoir, had rendered themselves thus liable, no jury or magistrate would have inflicted them under such circumstances. The law secured the Commissioners from personal responsibility, but he was not aware that any Act of Parliament secured them from actions in another court. That point, however, was not included in their inquiry. He was not aware that he had any further

remarks to offer. There were three points for their consideration :—First, the state of the embankment; secondly, the state of the waste-pit; and thirdly, the want of giving sufficient warning. It certainly was most extraordinary that timely warning was not given. In considering their verdict he thought they ought to consider whether some means should not be taken to prevent similar accidents; and, as they had other reservoirs in the districts, to point out, if possible, what would best secure their own safety, and that of their families also. The jury would also bear in mind that in charging any one they must charge them according to law. He would now leave the case in their hands, and hand over to them the opinion to which he had alluded; for he did not see that John Roebuck was more liable than any one else standing on the embankment at the time.

The jury retired to consider upon their verdict at a quarter to two o'clock, and returned into court at five minutes to four.

The CORONER.—Gentlemen of the jury have you considered upon your verdict.

The FOREMAN.—We beg to hand you the following written verdict (handing in a paper).

The CORONER read the following verdict to a crowded court, who listened to it with breathless silence:—"We find that Eliza Marsden came to her death by drowning, caused by the bursting of the Bilberry reservoir. We also find that the Bilberry reservoir was defective in its original construction; and that the Commissioners, Engineers, and Overlookers were greatly culpable in not seeing to the proper regulation of the works. And we also find that the Commissioners, in permitting the Bilberry reservoir to remain for several years in a dangerous state, with a full knowledge thereof, and not lowering the waste-pit, have been guilty of gross and culpable negligence. And we regret, that the reservoir being under the management of a corporation, prevents us bringing in a verdict of

manslaughter, as we are convinced that the gross and culpable negligence of the Commissioners would have subjected them to such a verdict had they been in the position of a private individual or a firm. We also hope that the legislature will take into its most serious consideration the propriety of making provision for the lives and properties of Her Majesty's subjects exposed to danger from reservoirs placed by corporations in situations similar to those under the charge of the Holme reservoir Commissioners."

OFFICIAL STATEMENT,

MADE BY

CAPTAIN MOODY.

The immediate cause of the late catastrophe was the middle portion of the dam at Bilberry Reservoir being lower than the top of the waste-pit.

This waste-pit was designed to carry off the waste or flood water, but the top of the embankment having sunk below the top of the pit, and suffered to remain so, the flood-waters had no proper or sufficient escape, but went over the dam, which, as a necessary consequence, gave way.

In the evidence before you, mention has been made of a spring, of different leaks, and defective workmanship, but so long as the level of the dam was below the level of the waste-pit, and the flood suffered to pour over the top of an embankment of this kind, it would give way, though there were no springs, no leaks, and though the best quality of puddling was put in as water-tight as possible. It would give way, though not so simultaneously, from top to bottom; it would be slower in its operation, but still quick enough to form a flood of terribly destructive effect in its course.

To enable the jury to apprehend clearly the force of all the facts of the case bearing directly on the engineering part of the question, it is necessary first to give some idea of the *principles* on which these kinds of dams are designed, and how they are carried out. This I will do in as few words as possible, and equally concisely offer a few observations on the design of this reservoir and dam in particular,

and draw your attention to the evidence given as to the manner in which that design was executed.

In constructing a reservoir of the nature of the one at Bilberry, the site being fixed upon, the extent or area of the district the surface water from off which will be drained into it, is ascertained. Calculations are also made from the most authentic records of the quantity of rain that falls upon and flows off this area in a given time, both on ordinary occasions and what may be expected in times of flood. In these calculations allowance is made for absorption and evaporation.

The capacity of the reservoir when full is estimated from levels taken at different depths.

To impound the water, an embankment is formed across the ravine, or valley, to the height that will contain the greatest quantity of water at a reasonable economical outlay.

The supply of water which may be needed for the manufacturer or other uses,

and for which the reservoir is constructed, is led away from the interior, and nearly at the bottom, by what we call "supply-pipes," or enclosed channels, constructed of metal or masonry according to the size. The quantity of water to be discharged is regulated by sliding-valves (called here "shuttles") working in these, or at the extremities of these pipes. The sliding-valves in this case work vertically, and are placed one behind the other at no great distance, and in the same pipe, so that the water passes through the opening of both slides, and if either gets fixed by accident or injury when *down*, the *passage* of the water is stopped, and the reservoir must necessarily fill, rendering it a difficult operation to get at the slide to rectify, besides losing the use or service of the water. It must be understood distinctly and borne in mind always, that these channels or pipes are solely for the ordinary supply of water for the economical purposes alluded to, and for these alone. Their capacity is regulated accordingly.

They should be protected from anything but water pressing upon or passing through, and this is generally done by iron grating, removed to a little distance and so designed that though obstructions may be intercepted, and for a time rest against them, there shall be space for the requisite supply of water to get into the pipes and through the slides.

To carry off the waste water, and the floods that may fall on the drainage area, other arrangements are made. In the case before you a circular pit of masonry was built up in the body of the embankment on the inner side. The ordinary supply pipes passed into the bottom of the pit, and a nearly horizontal culvert was constructed to convey away from the bottom of the pit the water coming through the ordinary supply pipes, as well as any waste or flood water flowing down into the pit. The culvert leads to a goit for the supply of mills down the valley.

When these waste-pits are adopted, I need scarcely impress upon you that they

are so designed in height and capacity, and the culvert also in capacity, that the flood or waste-water shall freely fall down the pit, and pass off through the culvert in sufficient quantities to prevent the water in the reservoir ever rising to the height of the top of the dam.

The position of the entrance to the supply pipes, and the plan for carrying off the flood waters at Bilberry, are, I understand, very common in this part of the country, but I would not counsel their adoption in such sites as the one in which this is situated, high up in a hilly district at the junction of two deep ravines, with precipitous sides and rapid descent from above—obstructions of various kinds may be expected to be continually brought down, particularly in heavy floods of rain. They would be drawn by the set of the current towards the pit, and may impede the escape of the flood waters in sufficient volume, by getting into the waste-pit and choking up the passage. Even if there was a grating

over the waste-pit, they would be gathered about it, and by the downward suction be kept upon it. It is stated in evidence that a tree once passed into the sliding valve and there remained fixed. When I caused the water remaining in the reservoir after the "burst" to be drawn off, a large stone was jammed against the entrance of the supply-pipe, and the whole bed of the swallow is deep in mud, and wreck, peat, ling, and stones, close up to the sliding-valve. Some arrangement at the entrance of the swallow to prevent this is always advisable, in addition to a proper description of grating in front of the valve.

I would prefer the byewash which is in more general use. It consists of a notch as it were, cut out at one or both ends at the top of the embankment. Through this notch the surplus water passes, and is conveyed away along the side of the valley on a broad open ditch or canal to a safe distance and then emptied into the valley lower down if

allowed to run to waste. . Obstructions getting into the byewash could be removed with more facility, certainty, and expedition. It is also possible to widen the channel on the side of the natural ground in some cases, and greater room made for escape on any occasion quite beyond human foresight.

I think it will be more convenient to you, if, before I proceed to allude to the embankment, I connect the foregoing observations to this particular case.

I estimate the drainage area for Bilberry Reservoir at 1,920 acres, shown on the accompanying portion of the ordnance survey. The space drained is coloured red.

I find it very difficult to get good data for estimating the quantity of rain that passed off the surface. Very careful records are kept at Woodhead, in the vallies on the other side of the hill-range, where Mr. Bateman is constructing a series of reservoirs for Manchester. By the kindness of Mr. Bateman I have had

access to these records, and calculating from them, and supposing equal quantities of rain to have fallen on both sides of the hill, on the day and night of February 4th, 1,920 acres would have given a supply of 500 cubic feet per second. I am under the impression, however, that a considerably greater quantity must have fallen on this side of the range at that particular time.

The accompanying drawings will give you the dimensions of the waste-pit, the slide-valves, and passage included between them, the dimensions of the culvert including its length.

[Captain Moody here laid before the jury several plans and drawings of the reservoir, which he explained to them, and then continued.]

The waste-pit is circular, 12 feet in diameter in the clear, the depth to the bottom of the culvert is 59 feet. The slide-valves are at the bottom and 18 inches in the clear, the space between them is two feet in diameter and 25 in

length. The culvert is 6 feet 4 inches high, and 6 feet 6 inches wide, semi-circular at the top, with perpendicular sides, and is 180 feet in length. The sectional area of the waste-pit is 113.09; that of the culvert, 35.4; that of the slide-valves, 1.7.

From these dimensions, with the pressure due to the whole height, the culvert has capacity to discharge about 1,500 cubic feet per second. The quantity coming into the reservoir is assumed at above 500, so that proper allowance has been made for its escape had the waste-pit been so circumstanced as to fulfil the object designed in its construction.

I will now proceed to make observations on the dam.

The water is impounded in the reservoir by an earthen dam across the valley. The one which has been adopted in this case is of a common construction, and perhaps the most economical. It is formed of a wall of puddle with a mass

of earth on either side. The puddle is 16 feet thick at bottom, and 8 feet at top. The inner slope of the earth has a base of 3 to 1, the outer slope a base of 2 to 1.

The length of the dam is 340 feet, and was carried up to 98 feet high, according to the original design. This mass, or rather that part of it on the outside including the puddle, acts by its weight, which should more than counterbalance the pressure or weight of water acting against it. The object of the puddle-wall is simply to prevent the water getting through to the outer portion. It is to keep the whole water-tight, and is not to be considered as having any strength in itself. Such a dam answers extremely well, if the materials are carefully selected and the whole work well executed.

The heaviest portion of the materials (the heavier the better, stones, &c.) should be placed on the outside, and the more binding materials on the inside.

Close also to the puddle-dam or wall, on both sides, the material should be very binding in its quality, and well rammed; the nearer it approaches to the effect of puddle the better.

In the construction of the Bilberry dam this careful selection has not been made. The material is similar on both sides, and loose in its nature. The inner portion is permeable throughout, and instead of the part next to the puddle-dam being closely rammed and almost puddle in its character, a dry, open, rubble wall or backing appears to be carried up from the bottom, on both sides of the puddle-dam, inviting the water, as it were, to act on the whole inner surface of the puddle, and to escape with greater ease at any leaks or fissures arising from settlement or bad execution of the work. In flowing over the top of the dam (which it ought not, if the waste-pit was in a position to act), the water would flow down through this dry rubble to the very bottom, and, acting on

any cavities or porous, or weak portions at that part of the embankment, would act with immense hydraulic pressure,—in fact, on the principle of an hydraulic ram. In the case before us you have it in evidence that the water, before passing over the outer surface of the dam, did pour down thus for half an hour, and also acting on the water which was forcing its way through leaks, and a spring at the bottom; the dam boiled up in the centre, as the witness stated, and burst out from the bottom, almost simultaneously with breaking away in masses from the top. It was thus the whole dam gave way, and the volume of water in the reservoir burst forth at once.

The construction and materials of the earth-work in the slopes of the dam are comparatively of minor importance to the puddle in the centre. The trench extending down the sides and bottom of the valley to receive the ends and base of the puddle-wall, should, as the specification before you provides, go down

to the solid rock or impervious strata. All springs should be carefully led away, and even every fissure got past or through until all is safe, firm, and solid, clear of water, or what might be channels for it when the reservoir is filled, after the completion of the work. This observation applies equally to the sides as well as to the bottom. In executing this, it sometimes happens that very heavy and quite unforeseen expenses have to be incurred. The excavations are sometimes obliged to be extremely great in depth, and if the rocks are shaky or open in their stratification at the sides, it may be found necessary to puddle all over the ends or junction of the dam with the sides of the valley. It may be necessary to puddle part of the sides of the reservoir itself. In short, no care can be too great, and no expense withheld to make all perfectly water-tight. Leakages or springs are continuous and continuously injurious, reaching even-

tually, perhaps to very heavy expenses, if not to disastrous effects.

The puddle should also be of the best quality. But puddle should always be excellent. There are different opinions as to the best mixture. In this instance gravel and clay are mixed together, and it is unequal, though what is now seen in the embankment may be considered good. You have evidence of much which we cannot at present see, being bad, and the effects which are to be observed seem to confirm that evidence. To be water-tight and not liable to crack or settle unequally are the conditions good puddle should fulfil.

The trench to receive the puddle-wall at Bilberry Dam was cut down to a depth of 9 feet in the centre, in consequence of coming on a soft place. At this depth it appears that a very strong spring was tapped in the lower strata of shale. The section before you shows the stratification of the rocks (millstone, grit, and shale),

and from the dip it will be seen that water might be expected to rise where it did rise. The stratification of the rocks immediately above the dam, are full of fissures and very shaky. From the runs showing themselves lower down than the dam, and the leaks at each end of the dam, when there was much water in the reservoir, it is to be inferred that the openness of the strata was not sufficiently regarded.

It appears in evidence that the spring at the bottom of the puddle-trench was not led away by any of the usual modes. I think it proper to observe that the expense of doing this would have to be borne by the contractors. It however was not done, but very objectional plans resorted to in hope of choking it up, or "weighting it down," to use the words of the evidence. But it was not to be "weighted down," it rose as the work rose, materially infusing the lower portion of the puddle; making it weak and bad, of a nature to be easily worked away with the water of the spring,

as the latter forced itself through the outer part of the embankment like a little rill of water issuing from the foot. At times this rill was clear, and at times muddy and yellow. The muddyings varied with the head of water in the reservoir. To the weak nature of the puddle at the base, and the washing away from time to time by the continuous run of water from the spring under the bottom of it, the great settlement of the puddle-dam in the centre is to be attributed, a settlement which continued to go on during the construction, and after the dam had been raised to the height required in the specification. Of late years the settling down appears to have gradually ceased; doubtless the soft puddle had been nearly all squeezed out, and then would probably commence a different mode of action, leaks increasing in size and unequal settlements causing fractures.

The formation of the pits or craters along the top of the embankment admit of speculation as to their cause. It is not a

matter of certainty. The lowest point of the pits now remaining are exactly at the edge of the puddle-dam, and immediately over the dry rubble backing described before. In one instance the lowest point is at the inner edge, and in the other at the outer edge of the puddle-dam. They might have been formed at the time of the high water or freshet alluded to in the evidence, and which filled the reservoir soon after its completion. At this time it is not unlikely that some water poured over the edge of the puddle-dam into the dry rubble backing carrying with it some of the earth, and leaving a crater-like formation. At the time of the catastrophe it poured into this portion, at the centre of the dam for half-an-hour. At the time to which I am alluding, it might have been only for a very short period. I am induced to think they must have been formed at an early period, when the bank was at its full height, because there is a similar formation on the right flank of the dam, at an elevation above the level of

the top of the waste-pit. The top of the dam, nearer the centre, but close to this little crater or pit, has sunk bodily all across ; and in the sunken part is a larger crater formed, I conceive at the same time as the higher one ; both are shown in the plans and sections before you. This sunken part is over the culvert, and is no doubt due to the washing away of the bad puddling over and about the culvert where it passes through the puddle-wall below. This bad work, and the fruitless attempts to remedy it, are detailed abundantly in the evidence you have had before you. That evidence does not bear *directly* on the bursting of the dam, but proves the inferior execution, the misunderstandings, and faulty management and control that has marked the whole construction of the dam.

From the description of a leak half way up the middle of the dam, as well as the great depth and width of the centre pit, as described in evidence, but now washed away, I would infer it is

probable the puddle was shaky at this part, and had some fissure near the upper portion, through which water leaked when the head of water was high. This shakiness would be caused of late by the continual wearing of the spring beneath.

I will not take up more of your time by alluding to other points that have attracted my notice ; I would first observe they would simply serve to show, in addition to what I have already stated, that the execution of the work was not what it ought to have been, and bad execution in works of this kind, or any works connected with water, is fatal. The work must be good and water-tight, or they will be dangerous, and their destruction must come sooner or later.

In the evidence there appears to have been much stress laid on the great cost of this reservoir. I think it therefore right to observe to you that in hydraulic engineering generally it is extremely difficult, if not impracticable, to say with certainty what the final cost may be. It

has been shown in evidence that eminent engineers have tendered estimates of different amounts to put the reservoir in an efficient and safe condition; the plan proposed being to cover the inner slope of the dam with puddling, and repitch it with stones, also to puddle a portion of the sides, and thus make it, if possible, water-tight. Still, if that had been done, it might not have answered so long as that full spring existed where it was, and unknown to the engineers also, runs of water round the flanks of the dam. They might have had to execute other works and incur other expenses. I am speaking of really eminent men skilled in their profession and well knowing what they were proposing. I do not mean "unprofessional" men who are unskilled, who do not know what they are proposing and had better, much better leave hydraulic engineering, and all engineering to engineers. I conceive it quite possible that it might have been necessary to extend the puddling

and pitching far up the sides of the valley, making it almost like a tank. It might have been necessary to do this. The stratification is extremely full of fissures and shakes. In this neighbourhood there are many mountain reservoirs receiving floods of water, impounded by mill dams or lofty dams; pray don't look upon them and treat them like fish ponds. They are engines of mighty force, strong in aid of your industry to augment your wealth, and terrible in their power to destroy if mis-managed or neglected. This fact must be indelibly impressed on the minds of all the dwellers in Holmfirth.

The conclusion of the above statement was marked by a burst of applause from the parties present.

The FOREMAN.—Is it your opinion, Captain Moody, that if the waste-pit had been sufficiently low, and although the embankment was in an unsafe state, would it have saved it from bursting?

Captain Moody.—I cannot but believe it would. I ought to add that it would

still be a dangerous embankment; but I do not, in my own belief, think that if the waste-pit had been lower it would have burst now. It would ultimately have burst, because the mischief was going on.

Captain Moody said he had been requested to offer to them a few observations on the state of the Holme Styres reservoir. He had inspected it. It was a hill reservoir similar to the Bilberry Mill reservoir. It appeared to him that they should not delay sending for some superior engineer well acquainted with these works. Take his advice, and carry it into execution. Don't think too much about making an economical bargain. They remembered what he told them just now respecting the grating which should guard the entrance to the ordinary supply-channel. There was one in this case, but not of a good design. It was vertical, and close to the channel, if not a little within it. It might therefore get choked up, and the ordinary supply of water not be able to pass through it. There was also the

same arrangement in the sliding-valves, so that if either got down, the water could not get through and the reservoir must fill. When he saw the reservoir the water was 45 feet high, and there was a leakage in the valve-pit, and there being evidence of one outside the embankment of the culvert, the leakage in the valve-pit was very considerably increased. When he saw it, it was about the segment of a circle, 2 feet in the chord, and $4\frac{1}{2}$ inches deep, and by the stop-watch the water was running in at the rate of 16 inches per second. When he saw it the water running from the leakages alluded to was very muddy, and he watched it for a considerable time, in company with two brother officers. But these flaws were not so great as another. They remembered how he had recommended a bye-wash in preference to a waste-pit. There was a bye-wash to the Holme Styes; but when he went up to the reservoir the bye-wash was not only walled up, but firmly puddled! If the water had only risen a few feet higher

in the Holme Styes reservoir on the night of the late terrible calamity, the inhabitants of Holmfirth would have had a flood down the other valley, meeting the one from the Bilberry reservoir at right angles, and the destruction of life and property would have been most awful. (Great sensation.) He assured them that when he saw the byewash built across, he said, "these people are insane." (The audience unable to restrain their feelings, here gave vent to them in most unmistakeable terms.) He could not have believed it possible, that mill-owners who had property in the valley below could have suffered such a thing to exist. (Sensation.) But he saw it with his own eyes, otherwise he certainly could not have believed it. He took it upon himself, having the consent of the magistrates, to order the instant removal of this wall. (Loud applause.) There were sinkings in the reservoir. He would not tell them how he advised a remedy for the defects he saw, but would advise them to send at once for an

hydraulic engineer and act according to his advice. He would just add one word about the men who had charge of these reservoirs: these men were not paid enough, and they had no right to expect from a man, who had only £5 per annum, that knowledge which the duties of his office required. They ought to have competent men; and he would conclude by advising them that whenever these reservoirs got out of order not to attempt to remedy the defect themselves, but send for a competent engineer. (Applause.)

A Juror.—Would you state Captain Moody, at what depth you consider this reservoir safe?

Captain Moody.—The water ought not to be suffered to rise to the height of the sinking which is near the valve pit.

A Juror.—Did you then notice a sinking near the valve pit?

Captain Moody.—Yes.

A Juror.—Then do you think it would be safe up to that point?

Captain Moody.—I think it would be

well to avoid it. I have already stated that the bye-wash is out of order and should be repaired. I noticed to you that the water should be carried by a bye-wash to a point of safety down the valley, and I don't think the point of safety has been reached in this distance.

A Juror.—Do you think the principle a safe one in permitting the water from the bye-wash to drop down the valley?

Captain Moody.—I do not think it a safe one (great sensation, and cries of “we'll have it down.” “Let's pull it down.”)

Mr. Superintendent Heaton lustily cried out “silence, silence,” but the feelings of the indignant audience could not easily be suppressed, and a working man, who evidently spoke the sentiments of others, said “how can we be silent; we cannot sleep in our beds, we are so afraid of this reservoir bursting.”

Mr. John Hinchliffe proposed some rambling questions to Captain Moody, and concluded by a gratuitous assertion

that he was quite wrong in what he had said !

THE CORONER, in dismissing the jury, begged to thank them for their attention to the long enquiry upon which they had been engaged. He cordially agreed in the verdict which they had returned, which he considered not at all too strong, and he hoped that their verdict, along with the very judicious remarks, and the able report of Captain Moody, would have the desired effect upon the Commissioners of the Holme reservoirs, and would teach them that the affairs of the corporation should be conducted in a different manner to what they had been. If that would not accomplish the object, he was at a loss to know what would.

SYMPATHY AND SUPPORT.

Perhaps no occurrence within the memory of any living person ever called forth a greater amount of sympathy and corresponding support than this awful catastrophe at Holmfirth. No sooner had the dreadful intelligence reached the ears of the public, than donations in the way of clothing and money poured in from almost every quarter; and it is now calculated that the sum raised will reach not less than £50,000. This has been contributed by parties in all ranks of life, from the QUEEN to the humblest cottager, from the Peer to the peasant, and residing in the most distant districts of the Kingdom. The writer is happy

to be enabled to say that the sum thus realized, will go far towards mitigating the immediate wants of the vicinity ; though it must be many years before the Valley of the Holme can be in a position equal to that in which it was prior to the disaster.

Among the pleasing instances of sympathy may be mentioned the visit of the Lord Bishop of Ripon, on Saturday, February 15th. On the following day, his Lordship preached in the morning at Holmfirth Church, from 1 Thessalonians, iv. 13. In the afternoon, at Holme Bridge National School, from Revelations, iii. 20.; and in the evening, at Upper Thong Church, from Revelations, iii. 19. On Monday morning his Lordship went to Holme Bridge, and accompanied by the Rev. J. Fearon, visited and kindly addressed several of the sufferers in the neighbourhood. In the afternoon, accompanied by the Rev. R. E. Leach, the Bishop visited several of the sufferers in the neighbourhood of Holmfirth Church, and

whilst he expressed the kindest sympathy towards the sufferers, particularly and most affectionately addressed the eldest son of Hartley, who with his wife and five children were drowned.

In addition to this, his Lordship has been a very liberal contributor to the "HOLMFIRTH FUND."

In order to show that every exertion was immediately rendered on the spot to mitigate the sufferings of the survivors in this awful calamity, a placard containing the following appeal was issued on Friday, February 6th:—

TO THE BENEVOLENT AND HUMANELY DISPOSED.
—The magistrates in petty sessions assembled, hope that parties from a distance will leave subscriptions at the railway stations, the bank, Mr. Crosland's, stationer, and with the authorised collectors, towards affording immediate relief to those unfortunate individuals who are deprived of house and home by the sad and distressing calamity which has befallen this district.

(Signed)	JOSEPH CHARLESWORTH,	} Magistrates acting at Holmfirth.
	WILLIAM LEIGH BROOK,	
	JOSHUA MOORHOUSE.	

Friday Noon.

To carry out this arrangement "autho-

rised collectors," with boxes bearing cards duly signed by the above magistrates, took up the most important thoroughfares along the line of destruction, and realised during Saturday about £30.

A mixed committee of ladies and gentlemen was formed, for the purpose of distributing clothing to the sufferers, and consists of Joshua Moorhouse, Esq., John Farrar, Esq., Joshua Charlesworth, Esq., James Charlesworth, Esq., George Hinchliffe, Esq., Mrs. Joshua Charlesworth, Mrs. Leach, Mrs. H. Booth, Mrs. Boothroyd, Mrs. and Miss Gartside, Mrs. George Hinchliffe, and Miss L. Hinchliffe, and Miss Stephenson. The relieving officer also sat at the Town Hall, during the day, to relieve the destitute.

By this means the absolutely destitute were at once provided for, but there remained vast numbers of able-bodied workmen, who were deprived of employment by the destruction and stoppage of the mills. To meet *their* case, the following circular was issued by the relief com-

mittee, and addressed to all the employers on the stream:—

Committee Rooms, opposite Town Hall,
February 7th, 1852.

“The committee, conceiving that the mill owners and occupiers might now be affording some relief to the workmen thrown out of employ by the stoppage of their mills, have come to the resolution to request them forthwith to set to work their respective workmen in recovering salvage, and in clearing and restoring their machinery and premises (except actual buildings): and that the committee will, out of the funds placed at their disposal, allow to such workmen after the following rate, namely, Children under the age of 14 years, 4d. per day; from 14 to 18 years of age, 9d. per day; and Men above 18 years of age, 1s. 6d. per day. A weekly return of their names, ages, and occupation to be made on Fridays to the committee.

It is conceived this will be a better mode of relieving the destitute than actual charity. To these sums you will be at liberty, of course, to add on your own account such allowance as you may consider the workmen's labour to be worth, and thus earlier get your premises into working condition.

If you assent to this proposition, the committee will be obliged by you forwarding to them, as soon as possible, a return of the persons thrown out of employ by the stoppage of your works, in what department employed, and their names and ages.

You are also requested to see to the proper superintendence of such workmen.”

To all this little need be added to show

that every attention was paid to the wants of the distressed poor, and also to satisfy the subscribers to the fund, that their liberal contributions will be judiciously and economically expended.

MODE OF APPLYING RELIEF.—The plan of relief is to give *employment* as much as possible, but supplying the necessities of such as are unable to work or otherwise destitute.

All losses of furniture, &c., or damages of the amount of £20 and under, when the accounts are passed, are paid at once; the larger amounts when classified and arranged, it is proposed to submit to a Representative Committee to be elected from those Towns which have so nobly aided the Relief Fund, the Holmfirth Committee merely giving information, but having no vote.

There are at present about 500 Families on the books of the Relief Committee.

LIST OF MORE BODIES FOUND.

Since our list of the bodies found, given in pages 80 to 85, the following have been discovered, viz :—

- 74.—Mary Crosland, 19 years.
- 75.—Mary Metterick, 57 years.
- 76.—Joseph Dodd, 48 years.
- 77.—Alfred Metterick, 8 years.
- 78.—Thomas Charlesworth, 6 years.
- 79.—Richard Shackleton, 31 years.
- 80.—Ellen Ann Hartley, 3 years.
- 81.—Ann Bailey, 4 years.

The only bodies now missing are those of James Metterick, aged 57 years, and Joseph Marsden, 19 years.

A POEM.

Now o'er the downward slope the torrent pours
 With thund'ring crash and desolating rush ;
 The fields, whose grassy face beneath the shower
 Were kindling into verdure,—seamed and torn
 Are ribbed with stony furrows. Downward along
 The desolation spreads with vulture ken
 Scenting its prey afar. Vain are all checks
 Of pliant hedge-row, tree, or firm-built wall,
 To stem one moment ;—overcome, at once
 It bends, it bursts, and captive, sweeps along
 To aid the work of ruin. Hark ! the roar
 Is master'd by a cry, more fearful still
 Than rush of mighty waters. 'Tis the scream
 Maternal anguish utters,—as with one
 Fell swoop,—her husband, little ones, herself,
 All, all, are whirl'd into eternity.

No time to breathe one single prayer, or soothe
 Each other's passage. Crash ! a scream ; a groan—
 Bubbling from out the headlong watercourse ;
 And their fair forms, this moment in the prime

Of life, and health, and vigour,—batter'd float
 Amid the general wreck ; or buried lie
 Beneath the ruins of that happy home
 Where love, peace, joy, and bliss domestic reigned
 But yesternight supreme. O solemn thought,
 The life we live is in the midst of death !

All's well at eve, when, as in Egypt's land,
 The angel of destruction darkling came,
 And morning dawn'd upon their ruin'd homes,
 And not a house but mourned for its dead.

Go view the desolated scene ; and while
 Your heart with anguish sympathetic bleeds
 For others' woe, let not your pitying looks
 Or melting words of kindness satisfy,
 But your abounding stores godlike dispense,
 And bless yourself by soothing others' woe.

J. F. NICHOLLS.

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